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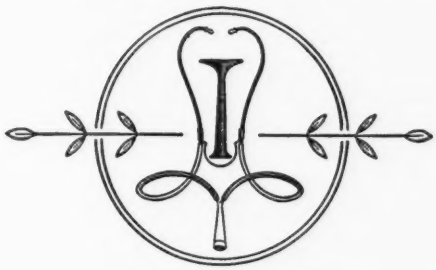

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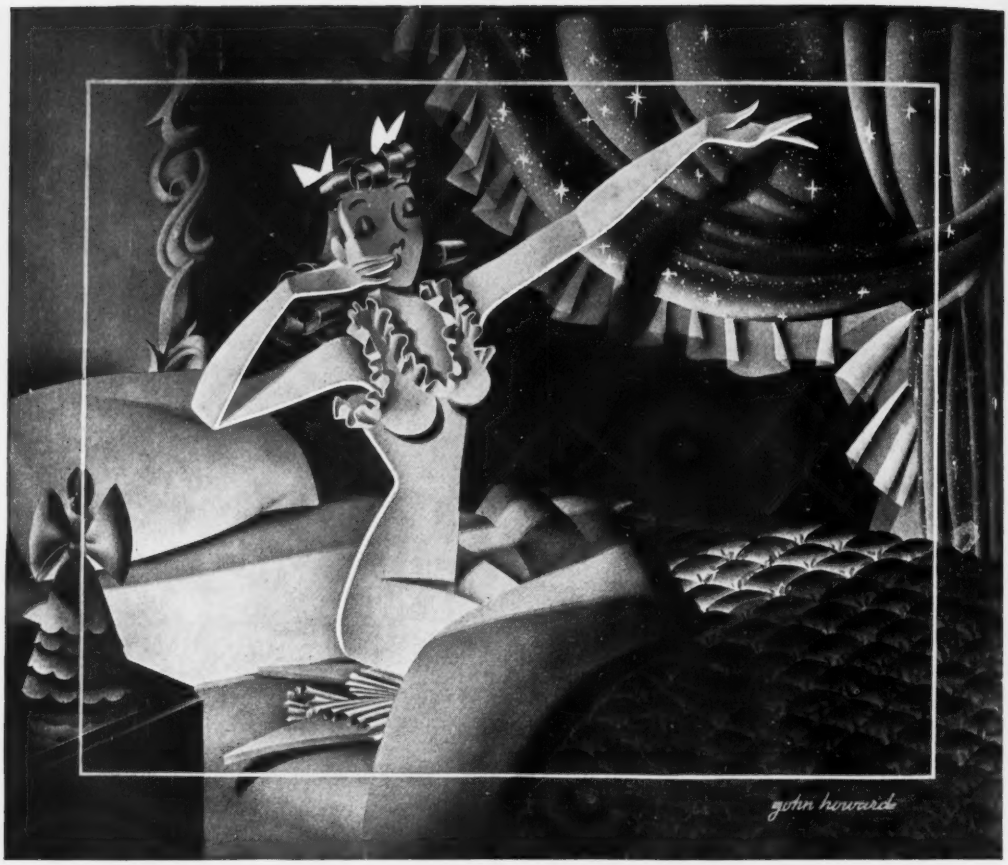

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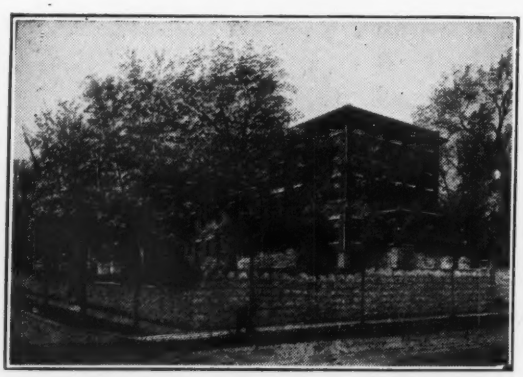

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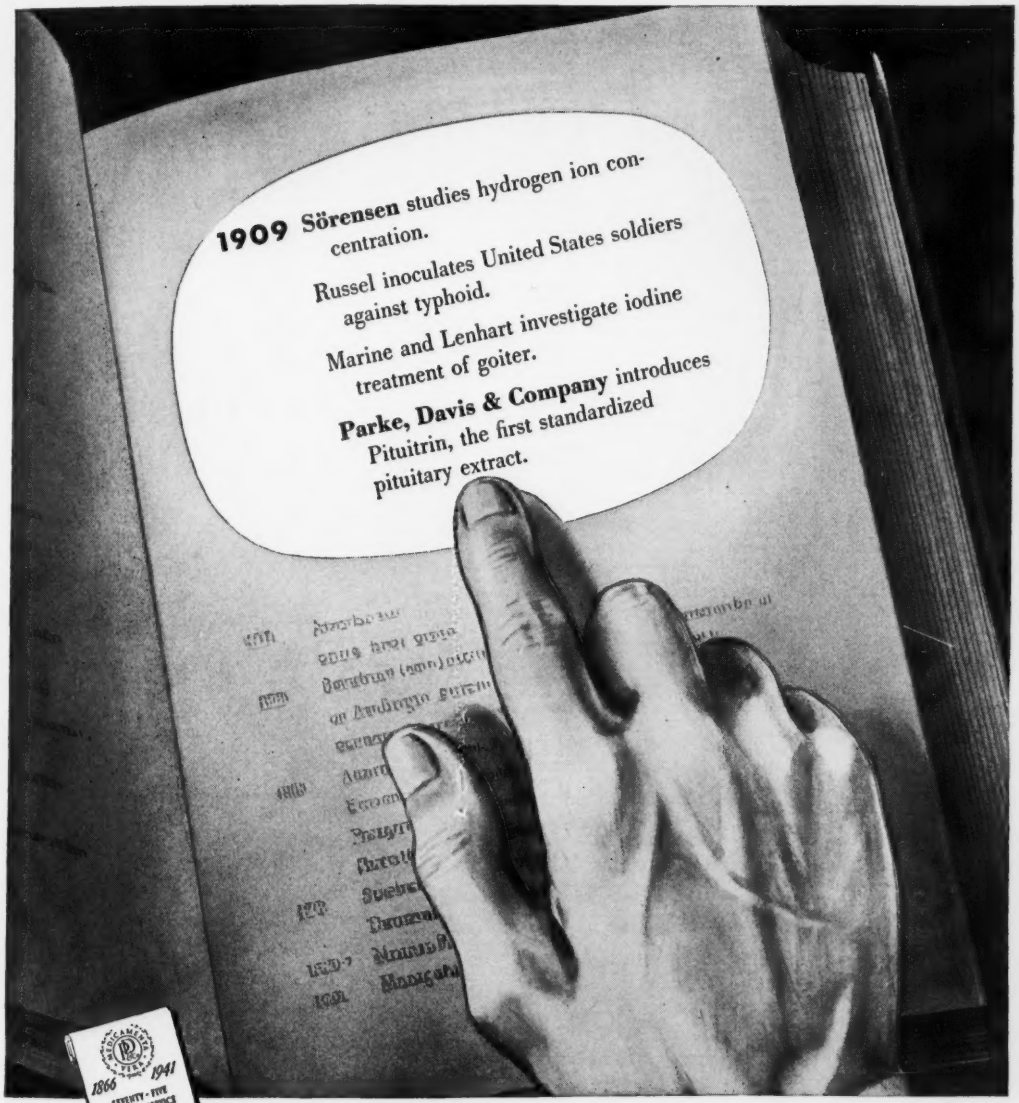
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[1] Cooke, R. A., and Stull, A.: *J. Allergy* 4: 87, 1933.

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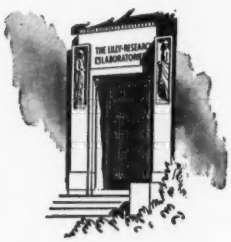

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THE PROBLEM OF CONTROLLING TUBERCULOSIS*

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In considering this problem one must first recognize two facts about pulmonary tuberculosis, namely:

(a) It is a contagious disease.

(b) Not all persons afflicted with the disease are contagious.

Mention is made of the first fact not with the thought of announcing any wonderful new concept towards the disease, but merely to emphasize and keep that point firmly in mind. It is the duty of all physicians to dispel certain erroneous ideas which the laity may have that are dangerous to their health. Contrary to what many lay persons firmly believe, everyone does not have tuberculosis germs in his system that are only waiting for him to become "run-down" for them to become active. The only way that a healthy individual can acquire tuberculosis is by coming in actual contact with the sputum or excreta of another individual who has the disease.

Looking at the second fact that not all persons afflicted with the disease are contagious it may be observed that roughly these cases fall into two groups:

(1) Individuals having pulmonary tuberculosis and a negative sputum. In other words, closed cases. In this group are the majority of the first-infection or childhood cases, the arrested or apparently arrested cases, many of the so-called "early"cases, and many of the type having old chronic fibroid or productive lesions.

(2) Individuals having pulmonary tuberculosis and a positive sputum. In other words, open cases. This group comprises almost exclusively the reinfection cases having pulmonary lesions best described pathologically as the acute-exudative and the caseous-pneumonic forms of tuberculosis. The greatest majority of cases fall into the caseous-pneumonic group having open cavities and highly positive sputum. These are the advanced cases most commonly seen and readily diagnosed. These are the dangerously contagious cases that, in being permitted to circulate freely among their fellow-men, are creating more and more of the so-called "early" cases which we have been endeavering to find and treat.

Now having established the fact that tuberculosis is a contagious disease and also pointed out which form of the disease is mostly highly contagious, the problem of what can be done to control the spread and eradicate it presents itself.

If there were a method of vaccinating or inoculating an individual against tuberculosis as with typhoid, small-pox, or diphtheria, the problem would be more simple. But there is not any such proven method. There is, however, a method which in the long run would be effective if it could be followed out to the letter. Find every case of tuberculosis. If it is an open, contagious case, isolate and treat that individual and keep him quarantined until he is either converted into a closed, sputum negative case, or until he dies. This may sound drastic and it is. However, when considering that each year over 70,000 persons, most of whom are in the prime of life, die from the disease, and, since it is humanly possible to eradicate this evil, drastic measures are most certainly indicated.

With these facts in mind the problem of control boils itself down to four principal measures.

LAWS GOVERNING THE COMPULSORY ISOLATION AND HOSPITALIZATION OF OPEN CASES

Many states already have some form of laws designed for the compulsory isolation and quarantine of cases of open tuberculosis that will not respond to ordinary persuasive reasoning, arguing that they are a public health menace. Every state should have such a law. A good strict one should be designed that can be definitely enforced.

More stringent rules have been applied to contagious diseases before with excellent results. For example, consider leprosy. Lepers are segregated in colonies far from their homes and must observe very strict rules and regulations. Persons afflicted with that disease have the same constitutional rights as anyone else, yet some of those rights are taken from them when they are forced into quarantine. More-

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over, leprosy is more mildly contagious than is tuberculosis.

Again witness the effectiveness of legal control by quarantine of other contagious diseases such as smallpox, diphtheria, typhoid and numerous others. Tuberculosis is as much, if not more, dangerous than those diseases.

SUFFICIENT AND PROPER HOSPITALIZATION FACILITIES

The first consideration regarding this measure is the number of beds that are necessary. The minimum accepted standard is two beds for every annual death. Forty-one states[1] lack that minimum number and twenty-seven have less than one bed per annual death. It is of prime importance to see that there are a sufficient number of beds available because the value of any successful attempt at finding these cases will naturally be offset if there are no beds in which to place them. By the same token, if there are no laws compelling them to remain isolated during their period of infectivity, case finding will go on forever. The above statement does not necessarily mean that even a two bed per death ratio would be enough for all communities alike. In some, the problem is greater than in others and many more than that would be needed. The fact of the matter is that there should be a sufficient number of beds to take care of all the cases.

Another fact under this heading is that tuberculosis institutions should be as well equipped as general hospitals. No longer are these institutions merely sanatoria. The old boarding house treatment of tuberculosis is definitely out. The time honored rest, good food and more rest has been supplemented in over half the cases by definite active measures for treatment. In practically all of the open, advanced tuberculosis cases some form of collapse therapy is immediately indicated. This means that the tuberculosis institution must become a hospital fully equipped for pneumothorax and major chest surgery. Thus operating rooms and graduate nurse personnel is necessary. Chest surgery is not the only surgical consideration, as many of these patients during the course of their long stay in the hospital develop other conditions requiring surgical intervention. There must be facilities for general and gynecological surgery, orthopedic and genito-urinary surgery as well. Tuberculous mothers should be delivered of their babies in these institutions which means departments for obstetrics and pediatrics. All of which indicates the necessity for the staff of the institution to be composed of doctors in all the various specialties.

A most important result to a community in having an institution like this is the remarkably rapid increase in the interest of the medical men in that community towards tuberculosis. Their increased interest and education in the subject is in turn imparted to their patients and the lay public in general. As soon as the general practitioner sees active measures with rapid results taking place he becomes interested. He will attend medical-surgical and clinical-pathological conferences held at such an institution regularly in an attempt to learn what was not taught him in medical school. Thus a great step in tuberculosis education is accomplished.

The next part of a good control program follows in proper order.

CASE-FINDING

Improvements in dealing with this measure are occurring rapidly each year. In the first place more attention is being paid to adults and to the x-ray. In the words of Dr. Robert Plunkett[3] of New York, "Pulmonary tuberculosis is a disease primarily of adults." There seems to be a gradual tendency towards de-emphasizing the importance of childhood tuberculosis. This is logical for many reasons. In the first place the majority of first-infection or so-called childhood tuberculosis is benign and has a tendency to get well of its own accord. The cavity is the main source of tuberculous infection. As Dr. Robt. G. Bloch[4] points out, "There is no better prevention for children as well as adults than the elimination of the sources of infection." Dr. Frank W. Burge[2] very beautifully pictured the dangers of the open case in an editorial in the Journal, Diseases of the Chest, when he said, "Thousands of people, sick with tuberculosis in an infectious state, are going about in the District of Columbia, expectorating into the grass of the beautiful parks where the little children of our legislators play. The little baby's hand goes down into the cool green grass and comes up gummy with millions of tuberculosis germs to go into that rosey little mouth.—Tuberculous waiters and cooks are feeding our heroes, tuberculous nurse maids are in their homes, tuberculous clerks are handing them infected papers, and infected stenographers are coughing at their side." A lovely picture (in a morbid sort of way) but it can just as aptly apply to any of us and our families if we reside in a locality that is in need of an effective control program.

As for the increased use of the x-ray, this can be summed up in few words. Tuberculosis should be seen and not heard. Even in the hands of experts the stethoscope must bow to the use of the fluoroscope and the x-ray.

Case finding then, will be more productive of results when applied to adults and the lavish use of the x-ray.

In a survey of where tuberculosis deaths occur, reported in the New York State Journal of Medicine, November, 1939, Edward X. Mikol[5] found that 49.2 per cent deaths occurred in tuberculosis hospitals and tuberculosis departments of general hospitals; 29.6 per cent in homes; 11.2 per cent in state mental and penal institutions, and 9.9 per cent in general hospitals. This article also points out the danger of infection to members of the family from those cases which die at home.

Mass surveys by means of x-rays of groups of population is one of the best methods of case-finding. Some of the types of surveys with results are described in the following discussion.

Tuberculosis in Mental and Penal Institutions.—The high percentage (11.2 per cent) of tuberculosis deaths that occur in these institutions as described by Edward X. Mikol[5] is significant. In Minnesota, a survey of about 12,000 State Mental Hospital inmates revealed 9.2 per cent who had x-ray evidence of the disease. In a New York State Mental Hospital survey of 2,000 ambulatory patients, 3.6 per cent had tuberculosis. A survey made by David Reisner[6] of the population of two penal institutions in New York City revealed 3.7 per cent tuberculosis in one and 10.6 per cent in the other. Statistics such as these indicate very clearly the importance of mass x-ray of all the inmates of every such institution.

Case-Finding in Industry.—This is a fertile field worthy of inclusion in any well organized tuberculosis control program. X-ray of the workers and newly hired employees in big industry helps both the industrial executives and the control program as well by cutting down loss of time from work and reducing compensation costs. The state and local associations should establish a closer working contact with industrial and labor organizations. Some insurance companies and labor unions have already become active in promoting health education and many case-finding projects in industry have been undertaken.

Unrecognized Tuberculosis in General Hospitals.—Some very illuminating and instructive surveys have been made along this line in Wisconsin and New York. Robt. E. Plunkett and Edward X. Mikol[7] report, in a study made of 4,853 admissions to fourteen general hospitals, that 2.6 per cent showed x-ray evidence of tuberculosis. In 0.6 per cent of the whole group studied, tuberculosis had not been considered as a possibility, thus the x-ray revealed the first evidence of disease. Using this figure as a basis would mean that there are more than 40,000 unrecognized cases of tuberculosis hospitalized in general hospitals in the course of one year. This illustrates the danger of transmission of the disease to nurses, internes, and other personnel by these hidden cases. Many other unsuspected thoracic diseases were also encountered. It is thus evident that here is a comparatively new field that could be worked to advantage all around.

Space will not permit inclusion of many other mass surveys that have been started in other parts of the country. For an excellent, detailed description of mass surveys in case-finding reference could be made to the supplement to the American Review of Tuberculosis, June, 1940, compiled by Dr. Herbert R. Edwards[8].

The cost of using the x-ray in mass survey may at first glance seem prohibitive. It is most certainly more expensive than tuberculin testing or just physical examination, but at the same time, there is no comparison with the information obtained. In the long run the economical savings will greatly outweigh the expense incurred. Witness for example, the great saving to the Federal Government that has occurred by the program of x-raying each man at Army induction stations. Since the last war the Federal Government has spent a total of $960,000,000 for medical care and compensation for cases of tuberculosis developing among soldiers and sailors. This represents an average cost of $10,000 per case. Dr. Robert E. Plunkett[9] in discussing the results of x-raying 12,414 men at three army induction stations in New York State; stated that, "During three months the State Department of Health has saved the Federal Government about $1,050,000. Of the 12,414 men x-rayed, 106 were rejected because of evidence of tuberculosis. The cost of x-raying these men was about $7,000. The cost of discovering each case of tuberculosis was $66. On the basis of the policy established by the federal authorities during the last war, these cases would have cost the Federal Government $1,050,000 had they been taken into Army service, as compared with the cost of keeping them out."

Methods have been devised, that are worthy of being investigated, to cut the cost of mass x-rays. One that is working out satisfactorily in some parts of the country is the use of paper film. With the use of paper roll film the cost is seventy-five cents per examination. Another is the fluorographic method utilizing thirty-five m.m. film at a cost of five or six cents. General Electric is putting out an equipment using four by five film. Thus there are many types of equipment to choose from in carrying out a mass survey program.

The fourth and last part of a good control program has to deal with the following:

FOLLOW-UP AND REHABILITATION OF CASES

The follow-up of cases is very important. Every case should be registered and the records kept on file until the patient dies or moves to a new community, at which time they should be forwarded to the new community. Frequent, regular periods of re-examination should be maintained, including both x-ray and sputum examinations. It is particularly important to instruct an arrested patient to report, with sputum, for examination if and when he should develop a cold. Many cases do not produce any sputum unless they develop a cold and many times the so-called cold turns out to be re-activity of their tuberculosis.

The problems of rehabilitation are many and intricate and have long been neglected. It is made more complex by the fact that economic security of the family unit should be maintained without the stigma of a dole during the long period while the activity of the disease persists. This tremendous problem could be greatly lessened in two ways. First, the discovery of the case earlier before loss of work and money spent on erroneous diagnoses has taken its toll of the family savings. Too often is the onset of tuberculosis mistaken for a severe cold, flu, pneumonia and even thyroid trouble and cancer of the lung and valuable time is lost when a simple x-ray and sputum examination would reveal the true disease. Secondly, by institution of proper collapse measures earlier thereby saving time. Not putting the patient to bed for from three to six months and waiting (to see if that cavity won't close spontaneously) before starting a pneumothorax. These are months wasted and that patient's family must eat. Also, during that loss of time, the cavity might get larger, adhesions form, and possibly a spread to the other side occur.

The last concerns the retraining of some of these individuals to assume a new place in industry. Many can go back to their old jobs but others must be trained for less difficult work. This envolves maintaining competent teaching personnel and facilities for educating patients for light work.

SUMMARY

1. From the public health point of view it was emphasized that the most dangerous individual with tuberculosis is the open case.

2. The necessity for the creation of compulsory isolation and quarantine laws regulating the contageous cases was pointed out.

3. Two beds per annual death is the minimum standard for all communities.

4. A tuberculosis institution should be considered a hospital and have all the treatment facilities and personnel necessary for all types of medicine and surgery.

5. X-ray examination is of the utmost importance in case finding.

6. Particular attention should be paid to adults.

7. Various mass survey programs were described.

8. Follow-up of cases and rehabilitation of the patient holds the last but not the least place in any control program.

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Arteriosclerosis, the hardening of the arteries which threatens all persons over fifty years old, is the vastest of all medical problems of the future as well as the most neglected, Irving S. Wright, M.D., New York, declares in The Journal of the American Medical Association for September 14.

With the average length of life prolonged to over sixty years, he points out, such a disease condition becomes of increasing importance. There are definite degenerative changes present somewhere in the arterial trees of practically all individuals over the age of fifty, thus making possible the onset of arteriosclerosis. "Of the population over fifty years of age," Dr. Wright says, "sixty per cent (fifteen million) will die of some cardiovascular-renal syndrome (set of symptoms referable to the heart, blood vessels and kidneys) whereas only nine per cent will die of cancer. A very large but as yet undetermined portion of that sixty per cent will die as a result of degenerative changes of the arteries, with the cardiac (heart), renal (kidney) or other syndromes merely the results of secondary ischemia (local and temporary deficiency of blood) or hemorrhage.

"As these syndromes frequently produce prolonged and painful disability before death, a change in philosophical approach might well be considered. Perhaps the mere prolongation of life should no longer be sought as the highest goal but rather longevity only to such a degree as it is compatible with happiness and a full life free from pain and invalidism.

"The medical schools for the most part give woefully inadequate training in the study and care of arteriosclerosis. Too frequently the practicing physician fails to recognize its manifestations until gangrene has occurred. The public cares little for what it considers the vagaries of old age, although all who achieve old age are liable to them. Too few research workers have engaged in its study, to a large extent because of lack of endowment. Truly, it has been a neglected field in proportion to its importance."

SUDDEN HEART DEATH*

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Many laymen suspect sudden death as a likely possibility whenever any heart abnormality is diagnosed. They say "I knew it" if the physician appraises them of this possibility in the case of a relative. The lay coroner does not hesitate to name heart disease as the cause of death when a sudden unexpected death occurs although statistically only four per cent of all heart deaths are sudden. Many persons with heart disease through fear make invalids of themselves because they too have considered any type of heart abnormality as a frequent cause of sudden death. Since heart disease of some types is the most frequent cause of sudden death it is important that we as physicians be possessed of the facts on the subject. The lack of such wisdom on several occasions prompted a review of the literature and of my own records.

Within the past few years a number of significant articles have dealt with sudden death and particularly with various aspects of sudden heart death. Available data enables one to say that sudden death is or is not a likely possibility in any given case. Proper therapy can apparently prevent or delay this form of death in many instances. Occasionally patients are seen who have or whose families have been told that they may die suddenly because of some cardiac abnormality they have. Such advice is true in some but very improbable in many instances. It is questionable whether such a prognosis should be given to any patient but certainly a responsible discreet member of the patient's family should know if sudden death is a likely possibility.

The present discussion deals only with sudden death in persons with cardiovascular disease. Such sudden unexpected death in less than thirty minutes will be discussed from the aspect of: etiology and pathological anatomy; pathological physiology; accidents in treatment; and comments on the commonest cardiovascular diagnoses.

No doubt many relatively rare cardiac conditions such as rupture of a papillary muscle, medial necrosis cystica, ball valve thrombus, intercepted embolus, etc., may cause sudden death in a high percentage of such cases, but the rarity of these abnormalities permits them to be omitted from a practical discussion.

Clawson[6] reviewed 23,972 autopsy records and studied in detail the 928 cases of coronary sclerosis which occurred in the entire material. Twenty-eight per cent of the patients dead of coronary sclerosis had died suddenly. This has been quoted as being the commonest cause of sudden death.[36] Levy[22] found that sudden death in his series of cases with coronary sclerosis occurred more frequently in persons with coronary thrombosis and anginal pain. Thirty-three per cent of that group died suddenly—whereas in another group where no anginal pain was reported the incidence of sudden death was only eleven per cent. In Clawson's 928 cases only five had a ruptured myocardium with hemopericarium. This is significant since ruptured myocardium with hemopericardium is not ordinarily a rarity after fatal acute coronary thrombosis. Krumbhaar and Cromwell[48] studied the records of 654 cases of spontaneous rupture of the heart and found the great majority due to antecedent coronary disease with thrombosis and infarction. Fulton says one out of eight deaths in the two weeks following myocardial infarction have acute hemopericardium. Scherf points out that patients with rupture of the myocardium and tamponade from extravasated blood may live an hour or two. This has been emphasized by other authors (Goodall and Weir)[46]. Of three ruptured hearts among my patients who were recovering from coronary occlusion death was sudden in two but came two hours after rupture in one. The three were proven at autopsy. In Levine's classical monograph on coronary thrombosis, rupture of the myocardium occurred nine times in forty-six autopsied cases. Goodall and Weir in a large service reported eighteen cases of ruptured heart collected over a series of years in their experience. Emotion was considered the cause in one healthy heart that ruptured. Coronary sclerosis or occlusion was present in the others. In one of these the rupture had occurred over a fortnight before death and blood had escaped into the left pleural cavity and had been repeatedly drained. These facts suggest that sudden death in acute coronary thrombosis though not frequent is certainly not a rarity from ruptured myocardium and hemopericardium. It is interesting to note that several writers have insisted that sudden death at the time of a coronary occlusion is rare. Though Parkinson and Bedford[33] in their paper mentioned it as a possible complication of infarction, they said "at any time." With a large number of cases at the Cardiff Royal Infirmary, Boissard and Duguid concluded an article on the subject by saying:: "Sudden death as exemplified, for instance, by a man falling dead in the street, is a common enough occurrence and coronary thrombosis is sometimes cited as one of its causes, yet we have never, in spite of careful search succeeded in demonstrating a gross

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thrombosis in a coronary artery in such a case." On several occasions I have seen hearts with areas of myomelacia cordis indicating infarction of several days duration where the history indicated practically no pain was complained of and usual activity had been pursued until sudden death came. It should be remembered that sudden death several hours or days after an acute occlusion or in the presence of chronic complete occlusion is not unusual.

The summaries of these studies is significant to me since in our experience the commonest etiological cardiac diagnosis is arteriosclerotic heart disease, and in this type coronary occlusion though probably often not apprehended is relatively frequent.

Other etiologies and pathological anatomical states are associated with sudden heart death. Luetic aortitis was considered the cause of 101 out of 300 sudden deaths reported by Martland. Of the remaining 199 all but twelve had aortic regurgitation, stenosis or atresia of coronary ostia. Norris reported out of 14,000 autopsies two cases of syphilitic aortitis in youths aged nine and seventeen. Sudden death occurred in both cases. He quoted Clawson and Bell who found twenty-five sudden deaths in 126 cases of adult syphilitic aortitis an incidence of twenty per cent. Two hundred patients with syphilitic aortitis at Bellview came to autopsy on an average of 22.7 years after acquiring the disease. One patient died of aortitis eighteen months after his chancre. The deduction from these studies is that sudden death from luetic aortitis might be expected in from twenty to thirty-three per cent of cases, and if it occurs it is usually long after acquiring syphilis.

It is significant that the only valvular abnormality which has been justly blamed for sudden death is aortic stenosis. Regardless of etiology or other anatomical or functional heart disease that may coexist this valve affliction holds a threat per se of sudden death according to the literature. As an isolated lesion it is rare and when seen is usually from arteriosclerotic changes in the aged or as part of rheumatic carditis in youth and middle life. All the cases that I have seen fell into these two groups, and though death was sudden in a recent case—the patient had had, as is often the case, sieges of congestive failure repeatedly in the few years prior to death. Eleven to fourteen per cent of patients reported in the literature on aortic stenoses died suddenly.

Though chronic myocarditis as an entity has given way to more specific and accurate nomenclature, acute and toxic myocarditis seems to have been given more recognition in recent years. In discussing three sudden deaths from acute interstitial myocarditis which they were reporting, Helwig and Wilhelmy[11] said that eight out of fifty-two reported cases of acute interstitial myocarditis had died suddenly. Begg in Lancet reported electrocardiographic studies made on 100 cases of severe faucial diphtheria and was able to show variations from normal which he felt indicated toxic myocarditis in eighty-four per cent of the group. Scherf[41] has stated that definite transient electrocardiographic changes are commonly observed during acute infections. I saw Chiari[7] demonstrate the heart of a four year old boy who died suddenly of diffuse interstitial myocarditis on the third day of his diphtheria. The same pathologist a few weeks later demonstrated the heart of a man of thirty-two who had died suddenly of myocarditis associated with tonsillitis. Chiari spoke of four types of myocarditis. He stated that one saw myocarditis in septicemia as from abortion and in such cases circumscribed abscesses might be found. He said in diphtheria and typhoid one saw interstitial myocarditis. Rheumatic myocarditis with Aschoff bodies was the third group, and occasionally is seen the fourth type —a spontaneous or idiopathic myocarditis characterized by interstitial envolvement of chronic nature as evidenced by lymphocytes. This he said is the type occurring in lues. Fatal acute myocarditis is in our State, no doubt infrequent but should be remembered. In retrospect I am convinced that the sudden death of a middle aged man whom I had sent home following pneumonia was from such a cause. He insisted on walking for his mail the day after leaving the hospital and died suddenly. The only practical aspect is that sudden death from acute toxic myocarditis might be prevented in some instances if absolute rest be enforced until all evidence (tachycardia, poor heart tones, temperature, sedimentation and in some instances even electro-cardiographic studies) of activity of the primary infection or toxemia had subsided.

Pulmonary embolism is said to be much more frequent than is diagnosed. In persons who have had any congestive failure or who have had surgery (especially on thyroid, gall bladder and salphinx) it should be in mind at all times. It is stated (Scherf) than twenty-five per cent of persons who have had some degree of congestive heart failure have thromboses in pelvic veins . . . and it is common knowledge that pelvic and even femoral thromboses are not rare after surgery. These thrombi frequently give rise to pulmonary emboli and more often than suspected in the old man or woman the embolus has been of sufficient size to cause acute right heart failure and in some . . . sudden death. Definitive treatment administered soon enough may save the lives of many. At autopsy made possible by sudden death I have seen two hearts where large emboli, proven to have come from femoral veins, had become

lodged in the patients foramen ovale in each case. This which Koritschoner called "intercepted embolism" no doubt is uncommon and defies therapy, but pulmonary embolism is no rarity and deserves to be remembered to avoid delay in directing therapy.

In recent years non-penetrating wounds of the heart have been presented as entities to be reckoned with (Beck, Warburg). Of the protocols of 197 cases collected by Warburg[43]—"seventy-four died from their cardiac disease . . . the greater number died in failure with congestion; but in nearly all the cases where the heart was ruptured (nine) death was sudden; on the other hand "sudden" death was seen in seven cases where we have no knowledge of rupture." In summary sudden death occurred in sixteen out of seventy-four (21.6 per cent) heart deaths the result of non-penetrating lesions of the heart.

Other anatomical abnormalities mentioned in the literature as not infrequent findings after sudden heart deaths are: Acute miliary infarction (Liza and Hart),[16] acute coronary thrombosis (Liza and Hart; H. Smith);[39] Ruptured aortic aneurysm (Liza and Hart); Ruptured Esophageal varices; Fatty degeneration of the myocardium (Lambert);[18,19] Ball Valve Thrombus (LaPlace).[15]

One profits from the history and from pathologist at the autopsy table in learning what conditions seem to most frequently predispose to sudden death, but in preventing those accidents the pathological physiology is the dominant concern. Coronary sclerosis, coronary occlusion, leutic aortitis, acute myocarditis and aortic stenosis appear to be the principal anatomical abnormalities that have been found in the majority of sudden heart deaths.

Associated with coronary sclerosis and coronary thrombosis one frequently finds various arrhythmias. Premature beats arising in one of the ventricles or in the specific tissue as well as auricular fibrillation and flutter are among the commonest physiological diagnoses made. Conduction disturbances whether in the main bundle or one of its branches are not nearly as frequent in my patients as are the disturbances of rhythm due to exaggeration of the faculty of automaticity—as characterized in premature beats and auricular fibrillation and flutter. These facts lead me to believe that sudden death due to ventricular fibrillation is, in the type of problems confronting us, more frequent than that due to cardiac standstill. The literature is not in accord on this subject. Some say standstill is more frequent; others say ventricular fibrillation. Levine says: " . . . it is impossible to state, as it would be only a rare fortuitous experience if one actually obtained electrocardiograms at the moment of the final exitus." The matter is an important one since quinidine was beautifully shown by Nathanson[29] and corrobarated clinically by many to inhibit the incidence of premature beats and "Pre-fibrillation" of the ventricles. On the other hand if we feel that lack of automaticity and conductivity coexist to the degree of cardiac standstill, therapy would be much different. As in a case where rapid irregular rhythms alternated with asystole reported by Borg,[3] observation and study could suggest poor automaticity and standstill. There is no doubt that the two great immediate physiological causes of sudden heart death are: ventricular fibrillation and cardiac standstill. It is well to remember that usually a variety of findings may predict the probability of one or the other of those fatal states. Ventricular fibrillation may result from many anatomical or physiological abnormalities. Premature ventricular systoles arising in different foci often interrupt the sinus rhythm of a heart with widespread myocardial damage and irritability the result of arteriosclerosis, myomelacia cordis, fibrosis from other causes, anoxia from any cause, toxic influences such as digitalis intoxication and diphtheria. The files of any physician doing general practice or internal medicine invariably contain many records of such hearts. It is wise to make use of the electrocardiogram whenever any rhythm disturbance is not easily and definitely explained. Certainly a ventricular tachycardia of 200 can not be differentiated by ordinary means from similar rates of supraventricular origin. In such a case digitalis if given to the former might make things worse though in the latter it would be definitely indicated. As in tachycardias so also in bradycardias the electrocardiogram is the only dependable way to learn whether a rate of thirty, forty, or fifty is of sinus origin and hence harmless or nodal or idioventricular and indicating damage of the conduction system. I know of a man with a heart rate of thirty who lived with a known braycardia from the time of first examination to collect his twenty-five thousand dollar twenty-year endowment and who then was still enjoying good health. He had a sinus rhythm and rate of thirty. I have a patient with a nodal rhythm and rate of thirty, who in his sixties does heavy work here, but vacationing in a high altitude had recovered from an Adams-Stokes siezure. By and large bradycardias even though not of sinus origin do not endanger the individual as do the various tachycardias. Anoxia as caused from backed up gas fumes precipitated a dangerous tachycardia in a coronary sclerotic under my care, though the younger members of her family suffered only nausea and headaches from the fumes, which they all unknowingly inhaled for several hours. My patient's electrocardiographic changes persisted

for several days. Sudden death has occurred from anoxia from this and other causes.

Ventricular dilatation and acute ventricular incompetance have received mention as causes of sudden death and no doubt they occur often as a result of pulmonary embolism. Even in such cases rhythms incompatible with life no doubt actually determined the issue.

Hypertension accounting as it does for more than does any other cause of cardiac complaints in middle life prepares the way as do thyrotoxic states for sudden deaths from fatal rhythms in some small per cent of cases.

By all estimates the one physiological diagnosis deserving discussion as leading to sudden death is angina pectoris. The definition of the malady should as did Heberden's include the phrase "capable of causing sudden death." Heberden's classical account of the symptom complex remains unchallanged though the syndrome he described is now accepted to mean only the physiological type or effort type in contrast to the angina of rest—coronary thrombosis. It has been generally decided that Heberden's angina is due to partial anoxia of the myocardium. Every effort should be made to decide if the man who has anginal attacks has coronary sclerosis and whether the evidence indicates widespread coronary envolvement. The history aided by electrocardiographic studies and ophthalmoscopic examinations enables these decisions to be made. The prognosis is much worse and sudden death is much more likely if anginal attacks occur in a person with coronary sclerosis with myocardial infarction. Such decisions based on cursory studies can well be classed as errors of ommission and definite neglect on the part of a physician.

Other aspects of angina have received such ample discussion in current writings as to permit brevity here, but it must always be remembered that the possibility of sudden death stalks the anginal patient.

Another group of patients who may die suddenly are those who may need certain medications. In giving digitalis LaPlace has advised against combining large doses of calcium. It has been repeatedly advised by Joslin and others that the blood sugar level in older people should not be reduced too sharply. Digitalis has accounted for many sudden deaths; and in giving that drug every patient is his own rule. It was shown that ascitic fluid in previously digitalized persons often stores digitalis and sudden free diuresis in persons with such ascites may cause acute digitalis poisoning. For this reason if digitalis is to be given to the person with congestive failure, rest, paricentesis, and diuresis is often practiced before digitalization is started. Certainly edematous digitalized persons should be given mercurial diuretics cautiously. Sudden heart death has been brought on by large doses of thyroid extract in myxedema. It is generally known that arsenicals should be very cautiously if ever given to cardiovascular luetics since sudden death is a known possibility.

Thus there are pathological anatomical, and pathological physiological conditions from which sudden heart death most frequently occurs, and accidents in therapy have been cited. The information affords prognostic value as well as indicating therapy which may be life saving or life endangering. No criterion enables the physician to definitely prognose sudden death in a patient though he can appraise each case and make a statement as to the relative possibility of sudden death. For example, one may say in a well established case of luetic aortitis that sudden death may be the fate of one out of three or four such persons, and tendencies to arrhythmias may suggest which patient.

SUMMARY

1. Cardiac sudden death tho accounting for only four per cent of heart deaths is the commonest sudden death.

2. Coronary sclerosis with heart pain in persons who have had coronary occlusion is the combination most frequently seen in sudden heart death. (Up to thirty-three per cent of these have died suddenly.)

3. Sudden death in luetic aortitis is common. (Up to thirty-three per cent.)

4. Aortic stenosis is the only valvular abnormality in which sudden death is a threat. (Eleven to fourteen per cent.)

5. Toxic myocarditis may cause sudden death. Rest during infections and in convalescence is valuable. All diagnostic criteria should be used to establish the fact that the "activity" of an infection is over before allowing patients up and about.

6. Non penetrating wounds of the heart have been followed by sudden death in twenty-one per cent of a reported series.

7. The definition of angina pectoris should include the phrase "Liable to die suddenly."

8. There are therapeutic sudden deaths in heart disease.

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COBRA VENOM ANALGESIA IN SURGERY*

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Down through the ages the snake has been the emblem of healing and mystery. The staff of Aesculapius, with its entwining serpents, is a relic of antiquity which today not only identifies us with the medical profession but is symbolic of the ancient rites, superstitions and ignorance out of which scientific medicine has grown.

In recent years, snake venoms have been used therapeutically in epilepsy and certain blood dyscrasias and have proven efficacious in the control of hemorrhage. Of particular interest to the surgeon is the venom of the Naja Naja or Indian Cobra which is rich in a neurotoxin, possessing powerful analgesic properties. The satisfactory response to venom therapy in a series of twenty-eight patients suffering from the intractable pain of chronic arthritis, encouraged its use in surgery where it is now being employed pre and postoperatively with gratifying results.

PHARMACODYNAMICS OF COBRA VENOM

Crude venom is a transparent, amber-colored fluid with a specific gravity of 1110, is acid in reaction and has a slightly disagreeable taste. While it contains hemorrhagins, agglutinins and thrombase in varying quantities, its chief constituent is a thermostabile substance called Neurotoxin which has a special affinity for the respiratory center and the neighboring ganglia of the ninth, tenth, eleventh and twelfth cranial nerves. The hemolytic principle is removed by passing the venom through a Seitz filter and the cytolysins are separated by a process of heating since they coagulate at different temperature levels. By these means an almost chemically pure solution of the neurotoxin is obtained. The exact chemical nature of neurotoxin is as yet un-

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known but the recent work of foreign investigators indicates that it is related to the carbohydrates and is therefore probably a glucoside.

Cobra venom is contended by some to act peripherally on the nerve trunks and nerve endings much in the manner of curare but numerous experiments performed by Macht and his associates, [1,2,3,4] point indisputably to the fact that its action is on the central nervous system, which view is shared by the author who has administered over 328 injections to seventy-four patients with positive clinical confirmation.

The neurotoxin has a selective action on the pain center, per se, which is located in some subcortical area, presumably in the hypothalamus but its Modus Operandi differs distinctly from that of morphine inasmuch as it does not depress the entire cerebral cortex, rendering the recipient stupid and incoordinate. A patient given an injection of cobra neurotoxin not only is relieved of pain within forty to sixty minutes but actually feels better physically and mentally. The psyche is improved, the vision becomes clearer, hearing is enhanced, the appetite is increased and there is a general sense of well-being similar to that induced by caffeine.

Neurotoxin acts more slowly than the narcotics but the analgesia effected is more prolonged and increases with each succeeding administration, having a definite cumulative action due to its slow rate of dissipation within the brain substance (Macht[5,6,7,8,9]) morphine by comparison, exidizes rapidly producing a profound depression of all senses then as suddenly wears off making it necessary to repeat injections at three or four hour intervals for the continued alleviation of pain. Blood morphology and clotting time are not affected by the use of cobra venom even when given over long periods. Liver and kidney functions remain unimpaired. (Macht[10,11])

The venom when accurately assayed biologically makes its administration controllable and the resulting dosage is measured in mouse units. A mouse unit being that amount of neurotoxin, which when injected intraperitoneally into a white mouse weighing twenty-four grams, will kill the animal within twenty-four hours. The initial dose should never exceed five mouse units and will determine whether or not the patient is sensitive, refractory or responsive. Idiosyncrasy to cobra venom, which occurs but rarely, is manifested within forty to sixty minutes by drowsiness, restlessness, nausea, palpitation, erythema and pain at the site of injection and, in some instances, a mild diarrhea. If these symptoms appear, no further injections should be given. There has not been a single unfavorable response in the entire series reported by the writer and but one case proved refractory; i-e no relief from pain after the third injection. The toxicity of cobra venom is not great when compared with its therapeutic efficiency and its continued use, unlike the narcotics, does not lead to habituation.

COBRA VENOM IN SURGERY

The knowledge that cobra neurotoxin produces a slow but prolonged analgesia and possesses a factor of safety equal to or surpassing that of morphine, dilaudid, pantopon or codeine without the hazard of addiction, prompted its substitution for the narcotics in the pre and postoperative management of thirty elective surgical cases, representative of the type of operative work encountered by the general surgeon in his daily hospital practice.

In sixteen major procedures (Group I) intramuscular injections of cobra venom were begun seventy-two hours prior to the day of operation and in fourteen cases (Group II) it was started on the day preceding surgery. Injections were carried out on the operative day and for two days thereafter (Tables I and II). In Group I, eight of the sixteen patients required supplemental narcotic analgesia for

Table I

DOSAGE OF COBRA VENOM

Administered to Each Patient in Group I

	Mouse Units of Neurotoxin
Days Preoperative	
3	5
2	10
1	10
Day of Operation (Pre-anesthetic med. HMC No. 1)	
5 hours after surgery	10
Days Postoperative	
1	10
2	5
Total	50

Group I (Adults)

ELECTIVE OPERATIONS

No of Cases	Operation	Indications	Anesthetic	Morphine	Total
8	Hysteretomies	1. Fibroid uterus	Ether	1/6 1/6	1/3
		2. Fibromyomas	Ether	1/8 1/8 1/8	3/8
		3. Procidentia	Ether	1/6 1/6 1/6	1/2
		4. Subinvoluted uterus	Spinal	*	
		5. Multiple uterine fibroids	Ether		
		6. Submucous fibroid	Spinal		
		7. Fibroid with hypertrophic endometritis	Spinal		
		8. Intramural fibroids	Spinal	1/4 1/4	1/2
4	Herniotomies	1. Right indirect inguinal	Spinal		
		2. Left indirect inguinal	Spinal		
		3. Right indirect inguinal (testicle removed)	Spinal		
		4. Umbilical	Spinal	1/6 1/6	1/3
1	Cesarean Section	Previous pelvic fracture	Ether	1/8 1/8	1/4
2	Thyroidectomies	1. Non-toxic nodular goiter	Local		
		2. Thyroiditis (non-toxic)	Local	1/6 1/6	1/3
1	Cholecystectomy	Gall stones	Ether	1/8 1/8 1/4	1/2
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pain or discomfort (exclusive of pre-anesthetic medication) and the largest aggregate dose of opiate administered to any single patient postoperatively, was morphine grains one-half.

Ten of the fourteen patients in Group II needed opiates for the control of pain during the first forty-eight hours, following surgery and the total narcotics given to any one patient postoperatively, was pantopon grains two-thirds.

Group III, representing eight surgical emergencies, was given routine injections of venom but in increased doses. Injections of five mouse units were given on admission; ten mouse units six hours postoperative, and ten mouse units twelve hours later. (Table II.) A maximum of thirty mouse units was not exceeded in any twenty-four hour period. Each of these patients requested opiates for the relief of pain during the first forty-eight hours, but in three cases, less than one-half the amount of dilaudid usually given was found necessary. A patient with a perforated gastric ulcer received a total of three-twentieths grains of dilaudid and one-third grain of morphine the first three postoperative days.

The narcotic requirement in all three groups depended upon the individual's sensitivity to pain, the type of operation performed, whether or not local or generalized peritonitis existed at the time of surgical intervention and the extent of surgical trauma to which the patient was subjected.

Abdominal operations ordinarily attended by considerable pain due to postoperative distention consequent to intestinal manipulation, peritonitis or the use of restraining pads, necessitated injections of narcotics every four hours in order to make the patient comfortable, but when cobra venom was employed without, or in conjuction with morphine, pantopon or dilaudid, the total dosage and the number of injections of the opiates were greatly reduced. Morphine, in particular, when given in quantities insufficient to control pain, increased visceral tone and stimulated intestinal peristalsis but, in the past, when used in frequent effective doses, acted as a paralyzant and predisposed to the development of an adynamic ileus.

Cobra venom exerted no unfavorable action on the bowel and paralytic ileus was not experienced in any of the abdominal operations reported.

Table II

DOSAGE OF COBRA VENOM

Administered to Each Patient in Group II

	Mouse Units of Neurotoxin
Days Preoperative	
Upon admission	5
3 to 6 hours later	5
Day of Operation	
(Pre-anesthetic med. HMC No. 1)	
5 hours after surgery	5
10 hours after surgery	10
Days Postoperative	
1	10
2	5
3	5
Total	45 In 5 days

Group II (Adults)

ELECTIVE OPERATIONS

No. of Cases	Operation	Indications	Anesthetic	Pantopon	Total
1	Thyroidectomy	Non-toxic fetal adenoma	Local	1/3	1/3
2	Cholecystectomies	1. Gall stones	Ether	1/3 1/3	2/3
		2. Previous surgical drainage	Ether	1/3 1/3	2/3
2	Herniotomies	Indirect Inguinal	Spinal	.....	.....
		Indirect Inguinal	Spinal	.....	.....
3	Uterine suspensions	1. Retroversion	Spinal	.....	.....
		2. Retroflexion	Ether	1/3	1/3
		3. Retrodisplacement	Spinal	.....	.....
1	Perineorrhaphy	Cystocele and rectocele	Spinal	.....	.....
1	Colostomy	Cancer of rectum	Spinal	.....	.....
4	Salpingectomies (bilateral)	Pyosalpinx (gonorrheal	Ether	1/3 1/3	2/3
		Pyosalpinx (gonorreal	Ether	1/3 1/3	2/3
		Pyosalpinx (gonorreal	Spinal	1/3	1/3
		Pyosalpinx (gonorreal	Spinal	1/3	1/3

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Table III

DOSAGE OF COBRA VENOM

Administered to Each Patient in Group III

	Mouse Units of Neurotoxin
Days Preoperative	
Upon admission	5
(Pre-anesthetic med. HMC No. 2)	
6 hours postoperative	10
12 hours postoperative	10
Days Postoperative	
1	10
2	10
3	5
Total	50 In 4 days

Group III (Adults)

EMERGENCY OPERATIONS

No. of Cases	Operation	Indications	Anesthetic	Dilaudid	Morphine	Total
2	Salpingectomies	1. Ectopic pregnancy	Spinal	1/20 1/20 1/20	.....	3/20
		2. Tubal pregnancy	Spinal	1/20 1/20 1/20		3/20
1	Purse-string suture Omental reinforcement Dependent drainage 8hours after perforation	Perforated gastric ulcer	Ether	1/20 1/20 1/20	1/6 1/6 1/3mo	3/20
1	Oophorectomy	Torsion of ovarian cyst	Spinal	1/20 1/20	.....	1/10
1	Repair of Hernia (bowel not resected)	Strangulated hernia	Spinal	1/20 1/20	.....	1/10
3	Appendectomies	1. Acute gangrenous closure with drainage.	Ether	1/20 1/20 1/20 1/20	.....	1/5
		2. Acute catarrhal closure without drainage.	Spinal	1/20 1/20	.....	1/10
		3. Acute obstructive closure without drainage.	Spinal	Refractory to venom 1/20 1/20 1/20 1/20	.....	1/5

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CONTRAINDICATIONS TO THE USE OF COBRA VENOM

1. Cardiopathies with decompensation.
2. Aortitis.
3. Sensitivity (rare).

4. Refractory cases i-e—those failing to improve after two or three injections.

5. It is considered incompatible with the administration of iodine, silver salts and radioactive substances. (Chopra and Chowhan[12,13,14])

DISCUSSION

Cobra neurotoxin when given to thirty-eight surgical patients in doses recommended by the author, assisted materially in the relief of postoperative pain and discomfort. The full effect of the venom was manifested forty-eight to seventy-two hours after its use in cases prepared two or three days before surgery. Increased dosage on the day of operation proved effective inasmuch as fewer narcotic injections were required. The venom is synergic with the opiates and enhances their analgesic properties without making the patient utterly stupid or comatose. As a whole, those patients who received injections of venom were brighter, slept better, suffered less from gas pains and retained better appetities than those who had been narcotized for two or three days following surgery.

Cobra neurotoxin has an accumulative action which lasts several days after injections are discontinued, thereby extending the period of postoperative analgesia. Its recipient does not complain of blurred vision.

SUMMARY

Cobra venom was given to sixteen patients three days preoperatively, to fourteen patients one day prior to surgery and to eight patients on the day of operation. In all three groups the injections were continued for two to three days postoperatively.

In Group I—Eight of the sixteen patients needed narcotics for the relief of pain.

In Group II—Ten of the fourteen patients required supplemental narcotic analgesia.

In Group III—Each of the eight cases were given opiates for the control of pain but, in three instances, the dosage needed was approximately one-half the amount usually given.

CONCLUSIONS

1. Cobra venom, although slower in its action than the narcotics, produces a sustained analgesia after the third or fourth injection.

2. It is synergistic with morphine, dilaudid and pantopon in relieving pain.

3. It does not inhibit intestinal peristalsis or narrow the field of vision.

4. It is not habit forming and does not depress the patient—on the contrary it improves the psyche and stimulates the appetite.

TABLE COMPARING PHYSIOLOGICAL RESPONSE TO MORPHINE AND COBRA VENOM

	Morphine	Cobra Venom
Chemistry	Opium alkaloid	Related to the carbohydrates.
Action	Central (depresses entire cerebral cortex affecting all special senses)	Central (affects only the pain and respiratory centers).
Effect	Rapid.	Slow and cumulative.
Psyche	Depressed.	Improved, action similar to therapeutic doses of caffeine.
Field of vision	Narrowed, pupils constricted.	Widened, pupils normal or slightly dilated.
Acuity of hearing	Blunted.	Sharpened.
Sense of smell	Diminished.	Intensified.
Mental efficiency	Decreased.	Increased.
Appetite	Decreased.	Stimulated.
Liver and kidney functions	Possibly impaired.	Not affected.
Blood pressure	Lowered.	Temporarily elevated 5 to 6 points systolic.
Intestinal peristalsis	Small doses stimulate. Large doses, paralyze.	Not affected.
Margin of safety	Wide.	Wide.
Effect on fetus prior to cesarean section	Narcotizes and asphyxiates if given less than 4 hours before operation.	None.
Glandular secretory function	Inhibited.	Not effected.
Dosage (surgical)	⅛ gr. to ½ gr. q 3 or 4 hours.	5 to 10 mouse units, 2 or 3 times a day for four or five days. 35 mouse units maximum dose for any 24 hour period.
Habit forming	YES.	NO.

5. It is safe and highly effective when given in therapeutic doses.

6. The writer believes that cobra venom is a valuable addition to the armamentarium of drugs used by the surgeon in his office and hospital practice.

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THE EFFECT OF ANESTHETICS UPON THE LIVER

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Study of the action of anesthetics upon the liver began with chloroform, for this drug, besides being one of the earliest anesthetics, is one of the most dramatic in its effect on the liver. It is difficult to place the credit for discovery of this side action of chloroform, since the symptoms of the poisoning were at first attributed to acidosis and dismissed as such. Casper[1] in 1850 expressed the belief that chloroform might leave behind it a state of chronic poisoning which might terminate fatally hours, days, or even weeks after its administration, and he was perhaps the first to direct attention to this condition. In the same year Langenbeck[1] reported a death from supposed delayed chloroform poisoning seventeen hours after operation. Gradually the number of reports of deaths following chloroform anesthesia increased. At autopsy the most common finding was fatty change in the liver, heart or kidneys, or in all of these organs.

Leonard Guthrie[1] published in 1894 records of ten cases occurring in children, emphasizing that in at least five of these cases the liver was very fatty. He felt that the fatty liver was a predisposing factor and not a result. Sollmann[2] credits Bevan and Favill with the first recognition of the nature of late chloroform intoxication.

The symptoms of this condition are in order of appearance: copious coffee ground vomiting, jaundice appearing on the second day after the vomiting, increasing drowsiness with onset of coma on the third or fourth day, and hyperpyrexia during the last twenty-four hours.[3] La Rocque[4] quotes Benard's classification of the types of chloroform poisoning: 1. Serious (a) nervous type, marked by convulsions, delirium, vomiting and oliguria with bile pigments, urobilin and albumin in the urine; (b) icteric type, in which jaundice is the principal feature, with the above symptoms appearing at the end. 2. Mild, with less alarming symptoms and resolution in a few days. Jaundice is not constant and indeed some authors claim that it is not common. Convulsions occur in about one-half of the cases. The liver is usually palpable and tender.

At autopsy in these cases the liver is usually flabby and the parenchyma extremely soft. The cut surface has a yellowish tinge, probably due to staining with bilirubin.[2] Microscopically the cells are markedly necrotic, the necrosis beginning at the center of the lobule and extending more or less toward the periphery. Fat is usually deposited most heavily in the mid-zonal region, seldom in the central necrotic part of the lobules. These microscopic lesions cannot be demonstrated in less than six hours. They reach their maximum in forty-eight hours.

The histological changes reflect impairment of function as measured by the dye tests. Eight days are required for bromsulphalein excretion to return to normal after one-half hour of chloroform anesthesia. Administration of chloroform for two hours causes a decrease in dye excretion which returns to normal in about six weeks.

The liver shows damage by other tests also after chloroform anesthesia. After administration of chloroform to dogs for one-half hour, Sanford, Rosentahl and Bourne[5] found bilirubinemia and urobiligenuria lasting for three days. Following two hours of chloroform anesthesia, the icteric index rose to eleven units on the next day and required ten days to return to normal. The urobilinogen dilution index rose under these circumstances from a normal value of five to one hundred on the following day, and returned to normal only after ten days.

Other effects of chloroform which are interpreted as resulting from liver damage are increased urea in the blood and urine[6], decreased excretion of bile salts[1], increase in blood lipase, decrease in galactose and levulose tolerance[6], decrease in blood fibrinogen[7], increased blood cholesterol, and hyperglycemia.

Decrease in blood fibrinogen is generally accepted as a concomitant of liver injury, and in chloroform poisoning the two conditions show a remarkable parallelism of degree.

The cholesteremia and increase in blood lipase are undoubtedly related, although the mechanism of their production is not generally agreed upon. In fact, there is great variation as to the reported time of onset of the rise in blood cholesterol and its amount. Bloor[8] found an immediate rise only if the dog had been previously stuffed with fat, but he noted an after-rise two or three days later. Mahler[8] found the rise to be as much as 300 per cent. Hospers[8] found a gradual but continuous rise in blood cholesterol with continuous chloroform anesthesia. Succheschi and Manceau[8] found a slight rise. Reicher[8] reported a great increase. Ghose[9] observed slight but definite rise in blood cholesterol during chloroform anesthesia in rabbits, and a marked increase when the animals were killed by an overdose of the anesthetic.

From his work on pigeons Datta[10] concludes that

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probably this increase of blood cholesterol may be ascribed to mobilization of reserve fat, Hospers[8] seeks an explanation in the toxic degeneration of the liver cells, with liberation of lipoid substances.

According to Hospers[8] the hyperglycemia which accompanies chloroform poisoning is explainable on the basis of excitement. Most authors, however, feel that this hyperglycemia is in some way related to liver damage. Ravdin et al[11] attribute it to action of the anesthetic upon the liver cells, making them unable to store glycogen. These workers found no exact parallelism between the amount of glycogen lost from the liver over a period of time and the rise of blood sugar during the same period. They state that ninety-four per cent of the liver glycogen has been lost twenty-four hours after anesthetization with chloroform.

There is no entirely satisfactory hypothesis to explain the toxic action of chloroform upon liver cells. Paton[12] suggests fixation of the anesthetic by the cells, the degree of fixation depending on the vascularity of the tissue and its lipoid content, together with the fact that chloroform checks and finally stops the processes of oxidation in the cells. Fischler[13] explained the changes in the liver on the basis of associated fat necrosis produced by injury to the pancreas. Wells[13] expressed the view that the lesions of late chloroform poisoning arise because, although the oxidizing enzymes are suppressed, the autolytic enzymes are left free to digest the cells. Muller[13] ascribed the changes to the production of phosgene. Graham[13] points out that this substance, if formed in the body would almost certainly be hydrolyzed to HCl and CO_2. Graham was able to produce, by administration of HCl in suitable concentration, all the changes characteristic of late chloroform poisoning except that the necrosis was peripheral rather than central. He stated that the necrosis-producing powers of CH_2Cl_2, $CHCl_3$ and CCl_4 parallel the amount of HCl which these substances can theoretically yield in their breakdown, whereas ether and chloral hydrate do not liberate HCl and do not cause liver necrosis. One of the earlier theories was that the liver necrosis of chloroform intoxication was due to disturbance of cell oxidation, but Davis[14] found no relation between the liver damage and normal tissue oxidation and was not able to protect animals against chloroform liver injury by intravenous injection of organic oxidizing agents. LaRocque[3] mentions the opinion of Quenu and Kuss, and of Gilbert, Chabrol and Weill that icterus following chloroform anesthesia may be hemolytic in origin rather than hepatic.

In an attempt to make a direct attack upon the problem of liver damage and repair Schultz, Hall and Baker[15] injected chloroform into the portal system. The necrosis thus produced was central in distribution. There was remarkable mobilization of macrophages from the second to the fifth day, with fibroblasts coming in about the fourth day. From one to three weeks were required for organization of the necrotic tissue, depending upon the size of the lesion. Repair may be complete. When fibrosis occurs it is mostly periportal and perilobular. The liver cells are especially rich in glycogen between the first and fourth weeks of repair. Clotting capacity of the blood was definitely decreased at first, but during the later stages of repair clotting was unusually rapid.

If regeneration of liver cells is normal there occurs no acquired resistance to subsequent use of chloroform, but MacNider[16] reported that when repair is effected by cords of flattened atypical cells, which may remain syncitial and which may or may not excrete phenoltetrachlorphthalein normally, then the liver fails to show necrosis and dye excretion is normal after administration of chloroform for three hours. But if, under these conditions, chloroform be given for four hours at one time or for three hours on two successive days, then these atypical cells show modified central injury, proving that their resistance is only relative.

According to LaRoque[3] there is no clinical history of a case of hepatic lesions produced by ether, but such lesions occur as frequently as with chloroform. The lack of case reports suggests that the lesions are less extensive and less severe. Goldschmidt et al[17] did not produce liver necrosis in either dogs or monkeys with diethyl ether under the conditions of their experiments.

Mahler is quoted by Hospers[8] as having found that in man ether anesthesia produces a continuous rise in blood cholesterol proportional to the duration of anesthesia. Ether usually completely depresses the secretion of bile in laboratory animals during anesthesia, and diminishes the response to cholagogues[6]. According to Rosenthal and Bourne[5] there are no abnormalities of urobilinogen excretion and no increase in blood bilirubin during ether anesthesia. They state that at the end of two hours of ether anesthesia there is fourteen per cent dye retention, which returns to normal by the next day. Whipple and Speed[18] observed interference with phenoltetrachlorphthalein excretion lasting for twenty-four hours after two hours of full ether anesthesia. This impairment of function is not, however, of a degree to compare with that produced by chloroform.

Evans, Tsai and Young[19] found that in normal cats six minutes of etherization reduced the liver

glycogen to seventy-four per cent of its original value and that the liver glycogen reached its minimum (at about forty per cent of the original content) after one hour of ether anesthesia. They believe that this effect is probably due to liberation of adrenaline, since the fall is minimal after inactivation of the adrenals, but they admit the possibility of a direct effect of the anesthetic on the liver cells. Mann is quoted by Coleman[20] as having observed that ether causes hyperglycemia dependent wholly upon the liver. Ross and Davis[21] expresses the opinion that hyperglycemia in dogs under ether anesthesia is due to direct suppression of insulin by ether and Hospers[8] states that insulin prevents the rise of both sugar and cholesterol in the blood during anesthesia. Phillips and Freeman[22] report that elevation of blood-sugar level in cats under ether is considerably reduced by inactivation of the adrenals but does not disappear in the completely sympathectomized cat, suggesting that the hyperglycemia does not depend entirely on adrenal stimulation.

Vinyl, ether or vinethene was administered to normal dogs by Bourne and Raginsky[23] for one hour or more on three successive days and no appreciable change in liver function was seen. Repetition of vinethene for one hour on successive days did not alter the speed of recovery from chloroform poisoning. Goldschmidt, Ravdin and Lucke[24] were not able to recognize changes in livers of dogs given vinethene by open drop or by CO_2 absorption. When vinyl ether volatilized with air was given for three hours thirty-two per cent of the dogs had normal livers four days later, and twenty-eight per cent showed extensive necrosis. Leake, Knoefel and Guedel[25] found no gross changes in livers of dogs killed under vinyl ether anesthesia, even after repeated administration of the drug on successive days. Goldschmidt and his coworkers[17] were unable to produce liver necrosis in the monkey with vinyl ether, even after starvation. In dogs they found no necrosis after an hour of vinethene anesthesia. Ten per cent of the dogs showed necrosis after two hours of vinethene, and thirty per cent showed necrosis after three hours anesthesia. This necrosis was of the same type as that produced by chloroform. The same authors ligated the extrahepatic bile ducts and removed the gall bladders of three dogs. Two weeks later the dogs were given vinyl ether for one hour, during which time the liver was biopsied. When the liver was examined three days after vinyl ether anesthesia it was found not to be significantly altered, suggesting that vinethene does not harm the previously damaged liver.

According to Raginsky and Bourne[26] the action of avertin on the normal liver is about the same as that of ether, repeated administrations in dogs producing only mild parenchymatous degeneration of the liver and kidneys, with occasional fatty changes. These authors state, however, that with a given dose of avertin the anesthesia is deeper and lasts longer in dogs with impaired livers than in normal dogs. Avertin given to dogs poisoned by chloroform shows five to thirty per cent additional injury, varying with the severity of the original degeneration. The additional damage disappears within twenty-four to forty-eight hours, and recovery from the chloroform poisoning is not deterred. On the other hand, Coleman[20] states that seventy-seven per cent of thirteen patients receiving avertin anesthesia showed impaired liver function as noted by dye retention, and recovery of liver function was slower than with other agents. Avertin leads to marked stimulation of bile flow in the dog, during which the absolute amount of bilirubin secreted is unchanged, and the concentration is decreased. This bile flow is not influenced by insulin, atropine, epinephrine, reticuloendothelial blockage, or by administration of glucose orally. It is, therefore, the result of direct action of the anesthetic on the liver cells[6].

McKim and Bourne[27] report the administration of avertin to one patient twenty-four times for changing dressings. After the twenty-first anesthesia there was ten per cent dye retenion, and after the twenty-second time there was five per cent retention. The blood sugar time curves taken after each administration of avertin showed disturbance of carbohydrate metabolism, which the authors attribute to the presence of infection and toxemia rather than to the action of the anesthetic.

Greeley[28] records a case of death following the administration of eighty mgm. of avertin per kg. supplemented with nitrous oxide-oxygen for appendectomy. The patient was a white female twenty-three years old. Ten hours after operation she complained of pruritus. Vomiting began several hours later. After seventeen hours the vomitus had assumed a coffee ground appearance and the patient was complaining of abdominal pain although apparently not distended. The temperature was 101 degrees on the morning after operation, and rose to 109[1] within twelve hours. Thirty-six hours after operation the systolic pressure was seventy. At this time one liter of bile was removed from the stomach. The patient died at the end of forty-four hours. Greeley mentions Pribram's case who died forty-eight hours after cholecystectomy for which avertin was given as a basal anesthesia. She did not recover consciousness, developed total anuria, and at autopsy showed fresh injury to the liver and old arterio-sclerotic kidneys. In the same article is de-

scribed Kallman's case of death from avertin in which autopsy revealed fatty degeneration of the liver and acute nephrosis.

Raginsky and Bourne[29] gave cyclopropane to a normal dog for one hour daily for nine days, testing dye excretion. Twenty-four hours after the first and third administrations there was ten per cent dye retention, no retention on the other days. At autopsy on the tenth day the liver appeared normal grossly. Microscopically there was moderate dilatation of the intercolumnar capillaries and edema of the parenchyma most noticeable about the central veins, but no fatty change was seen. Another normal dog was given cyclopropane for one hour on two successive days, for three hours on the third day. It showed no dye retention on the fourth day. At that time the dog was given one-half hour cyclopropane anesthesia. On succeeding days dye retention was eighty per cent, ninety per cent, fifty per cent, and ten per cent. Cyclopropane did not prevent recovery of a liver which had been previously damaged with chloroform. Results with cyclopropane after starvation were inconclusive.

Using nitrous oxide-oxygen Coleman[20] found dye retention on the first postoperative day in one-third of twenty-seven patients. Excretion returned to normal by the eleventh day. This author quotes LaRocque's statement that nitrous oxide is the only anesthetic which does not damage the liver cells. According to Rosenthal and Bourne[5] anesthesia with nitrous oxide and ethylene for one to two hours without cyanosis does not result in demonstrable impairment of liver function. LaRocque states that among patients given nitrous oxide alone, only twenty per cent retained any traces of urobilin in the urine for more than five days. When nitrous oxide was given but no surgery was done, no urobilin or bile pigments appeared in the urine. Hospers[8] found that fluctuations in blood cholesterol with nitrous oxide and ethylene are of the same magnitude as those produced by excitement. A significant fact is that these fluctuations are decreased when morphine is given as premedication. Ethylene and nitrous oxide are accompanied by hyperglycemia which Hospers also attributes to excitement. Browne and Evans[30] observed a rise in blood sugar under nitrous oxide, although not so great as with ether. There is also a rise in blood lactate. They state that "no doubt the oxygen lack, together, perhaps, with some direct effect of nitrous oxide, acts on the central nervous system, and that the rise of lactate, like the rise of sugar, is due largely to a discharge of adrenaline into the blood seems most probable." When cats were decapitated under nitrous oxide the rise in blood sugar and lactic acid was much greater than with the anesthetic alone.

Sollmann[4] states that alterations in liver function produced by toxic doses of the barbiturates resemble those occasioned by infectious diseases. According to Beecher[6] there is no delayed damage with amytal, and immediate damage occurs only in a few cases. Bidwell, Shillito and Turner[31] found no significant change in total serum cholesterol after nembutal was given to dogs in amounts sufficient to produce deep narcosis lasting several hours. Ginesty is quoted by Hospers[8] as having found the blood cholesterol lowered after barbital anesthesia. Murphy and Young[32] observed a progressive rise in blood sugar under luminal for 270 minutes, after which it fell, although the liver glycogen fell continuously throughout. They suggest that in view of the evidence indicating that amytal inhibits the parasympathetic system, it is possible that amytal acts to decrease liver glycogen by preventing glyconeogensis. According to Evans, Tsai and Young[19] amytal removes about one-half the liver glycogen in cats in two hours. Dial reduced the liver glyocgen to about one-tenth the initial value in five hours. These authors mention the opinion of Hines, Leese and Barer that storage of glycogen from glucose is inhibited by amytal. This barbiturate is said by Zorn and her coworkers[33] to be the most effective of the series in inhibiting oxygen uptake in slices of rat liver. Barbital was the least effective. Reynolds[34] mentions finding areas of focal necrosis in the livers of white mice treated with pentothal.

Whipple and Speed state that paraldehyde, chloral and urethane in amounts sufficient to produce stupor usually cause a drop in phthalein excretion for twenty-four hours. When alcohol is administered over long periods to dogs, a certain number show an increase in excretion of phenolsulphonphthalein. Withdrawal of alcohol results in a decrease in elimination of this dye. The increase is believed to be due to failure of the injured liver to destroy part of the dye, which is then available for renal elimination. Sections taken from the liver at the time of this increase show cloudy swelling and marked edema of the outer cells of the lobules. The nuclei of these cells are smaller and stain faintly. The cytoplasm shows a variable amount of stainable lipoid. The same change is seen in acute intoxication of twelve hours duration. By the end of three days the edema is largely disappearing, with an improvement in the staining of the nuclei and decrease in the amount of stainable lipoid. Recovery begins near the central vein and progresses toward the periphery. Intoxication for twenty-four hours results in more extensive edema, and the liver is greatly enlarged and grayish-white. On the third day the

edema is decreased and at the twelfth day there is no histological evidence of liver injury[35].

For the sake of completeness Herzberg's[36] work on dogs killed with trichlorethylene may be mentioned. One dog showed extensive fatty infiltration, principally near the portal veins. In another all the liver cells were swollen and vacuolated although the cells membranes were clear and sharp. In the third there was a marked tendency to vacuolation and small scattered areas of fatty infiltration. Since similar changes occur in normal dogs the author attributes them to normal digestive and metabolic processes.

The effect of anoxia on the liver should be described becaue of its inseparability from anesthesia. Beecher[6] states that neither ethylene nor nitrous oxide produced any impairment of hepatic function in dogs, but that in the presence of anoxemia both immediate and delayed toxic effects follow. Rosenthal and Bourne[5] gave nitrous oxide and ethylene in a closed glass chamber under forty to sixty mm. pressure with intermittent oxygen, and found an immediate impairment of liver function which required several days for recovery. They also found that damage from either was much increased by asphyxia during anesthesia. Goldschmidt, Ravdin and Lucke[24] were able to decrease chloroform liver damage by fifty per cent by volatilizing the chloroform with oxygen instead of air. When ether was volatilized with a mixture of fifteen per cent oxygen and eighty-five per cent nitrogen instead of with air, liver injury was increased by sixteen per cent[11]. Ravdin et al[11] state that volatilizing chloroform with oxygen had no sparing effect on liver glycogen, but leads to more rapid restoration of liver glycogen concentration after anesthesia.

In view of evidence given in the preceding paragraph it seems hardly necessary to say that adequate oxygen intake during anesthesia is of prime importance in preventing liver damage. Because of the inverse relationship between liver glycogen and blood sugar following anesthesia it is fairly common practice to feed glucose preoperatively and to give it intravenously postoperatively, especially if the liver is already damaged. There is no doubt that this practice affords the liver some protection. The experiments of Goldschmidt, Ravdin and Lucke[24] are typical of those which prove this point.

More recently Miller and Whipple[7] have shown that liver injury by chloroform increases as the protein stores of the body are depleted and suggest that the protective action of glucose may be due to its protein-sparing activity. Neale[37] and Neale and Winter[38] experimented with the purines as protective agents and found that best protection was obtained in rats by giving sodium xanthine 100 mg. subcutaneously forty-eight hours before anesthesia and repeating twenty-four hours before anesthesia. Under these circumstances the livers of the rats showed only a few intracellular fibroblasts after two hours of deep chloroform anesthesia.

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(Continued on Page 304)

President's Page

To the Members of The Kansas Medical Society:

In this issue of the Journal appears the personnel of the various committees with their designated chairmen. May we assure them the heartiest cooperation in the performance of their duties, at times arduous and not too pleasant, at other times of great interest and filled with pleasure in their performance.

At this time may I state for this group of workers and for myself, your President, that timely suggestions and constructive criticism will always be helpful and assuredly welcome. As our work develops it will be noted some new arrangements in committee function will be suggested which it is hoped will facilitate and render less irksome some of the tasks of certain committees that have heretofore been almost prohibitive in time consuming detail.

For the chairmen of the various committees, may we begin now to thoughtfully survey the fields of our committee activities and be ready for reasonably early meetings to coordinate our work, and from the maze of material at hand, select certain objectives which seem most desirable of attainment for the ensuing year.

May I here note the great pleasure in meeting with the program committee in Wichita recently. The inclusion in this group of the several adjacent counties to assist with the work, while an innovation in our arrangements, already seems apparent of great value in lightening the burden imposed usually in its entirety on the host city.

Again may I express my appreciation for the wonderful cooperation of my official associates, and the universal response of the designated chairmen and committee personnel.

Sincerely,

Clyde D. Blake MD

President, The Kansas Medical Society.

EDITORIAL

COMMITTEES

As will be noted on page 304 of this issue, Dr. Clyde D. Blake of Hays, President, has announced the new Society committees which will serve during the year of 1941-42.

Committee work has become one of the foremost activities of the Society. Each of the twenty-eight standing and special committees handle numerous projects of importance to public health and medicine and collectively the committees work upon almost every problem or question on these subjects which are known or of present interest.

Dr. Blake contemplates placing in effect what appears to be a very efficient plan of organization for this year's committee work. The usual conference of committee chairmen is to be held in the near future, at which projects and activities will be assigned to the various committees. Immediately thereafter, each chairman will be asked to call a meeting of his committee for discussion of projects, for decision as to their approval or rejection, and for determination of ways and means in which they may be executed. Upon completion of this work, the projects will be further assigned individually to the members of the committees and each of these members will be asked to assume responsibility for completing the project delegated to him. In other words, that generally speaking under this plan it will be possible to accomplish and prepare studies upon as many projects as there are members of committees.

Dr. Blake is also to be congratulated upon the excellent distribution and arrangement of his committee appointments. The 261 physicians appointed to committees thoroughly represent every area of the state. Likewise, each county medical society has at least one member serving upon a committee.

LOCATIONS

The statement is frequently heard that medical graduates are no longer willing to locate in smaller communities and that as a result those communities experience a problem in obtaining replacements of their medical facilities.

With the thought in mind of determining the accuracy or inaccuracy of this allegation, Dr. J. F. Hassig, of Kansas City, Secretary of the Kansas State Board of Medical Registration and Examination, recently completed a survey showing the sizes of the towns in which doctors of medicine, entering practice in this state, have located during the past ten years. This study is reproduced below:

	TOWNS									
Year	Under 1000	1000 to 2000	2000 to 3000	3000 to 4000	4000 to 5000	5000 to 10000	10000 to 15000	15000 to 20000	20000 to 30000	30000 to 125000
1930	8	5	6	4	1	3	5	1	4	6
1931	4	4	5	1	0	5	8	7	1	11
1932	7	7	1	3	2	7	7	1	2	13
1933	5	4	0	4	6	1	10	2	2	7
1934	8	5	6	2	0	2	8	0	2	17
1935	5	4	4	3	4	7	7	3	2	20
1936	10	7	1	3	4	7	7	1	2	21
1937	4	9	5	3	2	4	9	0	1	21
1938	8	8	4	1	3	3	13	2	1	19
1939	5	4	1	0	3	1	7	4	3	34
Total	64	57	34	24	25	40	81	21	20	169

It would seem that the study supplies a rather accurate answer to the above question, inasmuch as the years included are recent years, as they are probably sufficient in number to furnish a good indication, and as they represent the major depression years. If this is correct, it is self evident that the statement is inaccurate insofar as this State is concerned. It will be seen that more than one-half of the physicians who have located in Kansas during the ten-year period have chosen locations in the smaller communities, and when equal division and distribution of population groups are considered along with the fact that the larger communities in this State have a majority of the State's population, it is clear that the smaller towns have had even a more favorable situation than the larger towns.

Of further interest in this connection is the fact that Kansas has no county which is not served by a doctor of medicine; that it has no areas which are more than thirty or thirty-five miles from a hospital; that the overwhelming majority of its areas are ten or fifteen miles or less distance from a hospital; that it has almost the national average of population per physician; and that its age groups of physicians and its specialists are well distributed throughout the State.

MEDICAL ECONOMICS

INDIGENT MEDICAL PLAN

Mr. C. J. Morgan*

Seneca, Kansas

In 1932 there were a few families receiving assistance from the county. There were undoubtedly more that received assistance from the townships and from organizations. This number has increased constantly since that time bringing with it problems of many kinds among which was that of providing medical care. In the beginning, the county commissioner or township trustee authorized what little medical care was financed by the county and with the establishment of the welfare program, this authority was given to the poor commissioner; whose title was later changed to the county director. The county director, having little or no medical knowledge, was placed in the position of determining who should have medical care and who should not. The increasing costs of medical care, questions of hospitalization within the county, and a lack of uniformity in fees were some of the problems to be faced.

The clients had their problems such as the difficulty of getting authorization for medical care and the constant necessity of going to the welfare office before going to the doctor and then going back to the welfare office before knowing if they were going to be assisted by the county, or allowed the medicine the doctor had prescribed.

The physicians also had problems such as getting authorization previous to giving care unless the case was an emergency and if it was an emergency, and treatment given first, the difficulty of getting the bill allowed; there were also difficulties in getting in touch with persons who could authorize, in having to make reductions with no plans for such, and the problem of knowing what to charge.

The physicians realizing there must be some method of control of expenditures and the Board of Social Welfare realizing the lack of knowledge and training of the personnel of the welfare agency in regard to medical matters decided to work out a plan that would give to each group the responsibility that should be theirs. The following plan was made and became effective on June 1, 1940.

AGREEMENT

It is hereby agreed by and between these members of the Nemaha County Medical Society, whose names are subscribed hereto, parties of the first part, and the Board of County Commissioners of Nemaha County, Kansas, parties of the second part, as follows:

In consideration of the covenants and agreements herein contained on the part of, and of the payments to be made by the party of the second part, the said parties of the first part agree:

1. To furnish all necessary and usual medical and surgical care within the scope and ability of the participating physicians, bandages and dressings, drugs and medicines and hospitalization to the indigent persons of Nemaha County, Kansas, as is or may be required by law to be furnished by a county in the State of Kansas.

2. To give to the Nemaha County Welfare Director a statement for services and supplies furnished to each case, and to give to said County Welfare Director a written report by the twenty-fifth day of each month, for each such person receiving medical attention, to be included in the records of the person receiving assistance.

3. To give to the Nemaha County Welfare Director a list of all such persons who have personally paid the treating doctor or any parties of the first part, for his services to such person, with the amount paid, by the twentieth of each month.

4. To furnish parties of the second part a unit fee schedule to be incorporated as a part of this agreement to be used in making county orders for general assistance cases.

In consideration of the covenants and agreements of the parties of the first part, herein contained, the party of the second part agrees:

1. That first parties shall receive, for the services herein mentioned, and as full compensation therefor (except for care at the State Tubercular Sanitorium for which the first parties are not bound) the sum of $825.00 per month payable as follows: $2.00 a month to be allowed in the grant of, and to be paid in advance to, those recipients of Old Age Assistance, Aid to Dependent Children, and Aid to the Blind who desire to have such amount included in their respective grants and who desire to personally pay the same to any of the first parties by the twelfth of the month, and the balance of said sum (or the difference between the total amount paid by said recipients and said sum of $825.00), to be paid to the representative of the parties of the first part on county orders on the Wednesday following the first Monday of each month.

2. To give the WPA employees the privilege of paying $2.00 a month if they desire the above mentioned services, this to be considered as over and above the guaranteed $825.00 a month, however if said WPA cases do not pay $2.00 a month, they are to be given emergency medical care as required by law in the State of Kansas.

3. To give to the first parties by the first day of each month, a list of all persons who are eligible to receive assistance during such month specifying those who will be allowed and paid $2.00 by the second party, including also a list of acceptable WPA cases.

4. To cooperate with parties of the first part in securing or attempting to secure free medical assistance and facilities from the State Board of Health and other agencies.

5. To promptly notify the secretary of the party of the first part of any complaint of any consequence concerning the operation of this plan.

*County Director of the Board of Social Welfare of Nemaha County.

It is further understood and agreed by and between the parties hereto that:

1. The term "indigent" persons, as herein used shall include those persons who comply with all of the provisions of this agreement and who receive Old Age Assistance, Aid to Dependent Children, Aid to the Blind, and General Assistance, and such other persons as may not be able to pay for medical care and to whom the county would be required by law to furnish medical care and assistance, and including also those persons on WPA and their families. Those persons who are not receiving some form of assistance shall be investigated by the Nemaha County Welfare Office and a certificate made relative to their eligibility.

2. The term "drugs and medicine" as used herein shall include all items prescribed by the attending physician or physicians to be used internally or externally by the patient.

3. Hospitalization shall be provided as and to the extent approved by the party of the first part attending physician and at those hospitals approved and recommended by parties of the first part, including hospitalization at the University of Kansas Hospital.

4. On the basis of reasonable distance and other reasonable circumstances, the indigent persons shall have a choice of doctors who are parties to this agreement and who desire to serve that particular person or family.

5. The indigent persons shall have a choice of hospitals that are on the list approved by the parties of the first part.

6. Any parties of the first part shall have the right to refuse or discontinue to treat any case in the same manner as in private practice; to require examination and treatment at designated places and hours; to have reasonable periods of time for appearance at necessary home calls; and to persue other restrictions reasonably in accord with the conduct of their other practice.

7. The parties hereto will cooperate in controlling malingering.

8. The parties of the first party are severally bound thereby, but are not jointly bound as partners; that said parties of the first part have not become partners by reason of this agreement, and that the legal liability of each party hereto is strictly limited to his own individual acts.

9. That this contract may be terminated by a thirty day notice in writing by either party to a representative of the other party.

Signatures.....

The following are observations and facts obtained after the plan had been in operation for a period of six months.

It is agreed by both the physicians and the Board of Social Welfare that the responsibilities are now where they belong. No longer is there the confusion, uncertainty and delay that was caused by having to get authorization for medical care from the welfare office. The county is providing funds for the payment of services given as it should; however, there is still the problem of ample funds. The cost has increased 11.3 per cent under the present plan. The cost now amounts to approximately ten per cent of our budget. There are problems that both groups will have to work out in this respect and with the needs for medical care and the limitation of funds, there will be this problem for a long time to come. The physicians have been more than cooperative and are doing all in their power to help the plan to succeed. The unit which they have received has varied considerably as indicated. The unit should be $1.00 according to the rates charged county patients.

June (twenty days)	$1.77
July	.37
August	.25
September	.51
October	.70
November	.51

The physicians have worked out agreements with the hospitals so that the charge for this service is quite low and the druggists have agreed to furnish medicine at cost plus fifteen per cent. The physicians pay the hospital bills, the drug bills, the secretary's salary, mileage charges and prorate the balance.

After six months of operation the plan has changed in one respect only and that is allowing $2.50 per case for every case that receives assistance. This has increased the amount paid the physicians some, however, it is not sufficient to make it possible for them to receive a $1.00 a unit. It was felt that due to the lack of funds and the need of adjustment of some problems within the group of physicians, no further change could be made at this time.

One feature is noticeable and it is the decrease in hospitalization during this time. In the six months the plan has been in operation, hospitalization has decreased thirty-four per cent. As far as we have been able to observe, the decrease is not made at the expense of our clients. In fact, it seems to us that there is a tendency to hospitalize in some instances where it might be avoided. There have been several cases of hospitalization and surgery in cases of old standing that were not assumed by the county under the old method. It appears there is some progress being made in the direction of persons being rehabilitated because of care received.

It is quite difficult for physicians to standardize their charges and also to keep the amount of drugs prescribed somewhat uniform. The following table shows the wide variation that existed during the six months the plan has been in operation.

Average Units Per Patient Per Doctor		Average Cost of Drugs Per Patient Per Doctor	
1. A (surgeon)	8.0	1. B	$4.07
2. B	6.5	2. I	2.24
3. C	4.1	3. E	1.71
4. D	3.8	4. K	1.40
5. E	3.0	5. F	1.08
6. F	2.6	6. A	.97
7. G	2.4	7. D	.97
8. H	2.3	8. J	.85

9. I	2.0	9. H	.72
10. J	1.9	10. C	.69
11. K	1.7	11. G	.63
12. L	1.6	12. N	.54
13. M	1.5	13. M	.53
14. N	1.5	14. L	.49

It is not the purpose of the above to cast any reflection on the physicians or druggists, however, it does indicate there is a wide variance in the methods of treatment of various physicians and indicates problems that will have to be worked out for the common benefit of all.

Another problem that has arisen as a result of the plan is the feeling among the physicians that the clients are asking for considerable unnecessary service. In the six months there was a 34.8 per cent increase in the number of cases eligible for medical care as compared with the same months before the plan was in effect and there was a 155.7 per cent increase in the number of persons receiving medical attention for the same period. The year prior, the opinion of those in the welfare office was that adequate medical care was given. This is due to the fact that any person who stated they were in need of medical care, cash allowances were made upon the recommendation of the physician and to the amount they thought necessary. There is some feeling that part of the increase is due to home visitors encouraging their clients to go to the doctors without regard to their need. The physicians realize that they too will have to help in controlling unnecessary calls.

The old age assistance cases contrary to our original belief are not receiving medical care out of proportion to the number eligible. The following table gives comparison of those eligible, those treated, and the cost of treatment.

	Per Cent of Cases by Categories Eligible for Medical Care	Per Cent of Cases by Categories Treated	Per Cent of Cost by Categories of Treatment
OAA	63.5	54.4	51.2
AB	1.8	2.6	3.1
ADC	9.3	10.4	8.9
GA	17.7	18.2	20.7
WPA	7.7	14.4	16.1
	100.0	100.0	100.0

Approximately sixteen per cent of the WPA cases are participating in the plan and it is seen that they are receiving more medical care in proportion to the number eligible than any other group. This figure might well be larger as during the time the worker has been laid off WPA if they have been paying, the payment is made for them as general assistance. A part of the group shown as general assistance are WPA families in which the head was not working.

The families do not seem to go from one doctor to another to any great extent as is shown below.

Patients Under the Care of More Than One Psysician

Per Cent of Patients	Number of Physicians
16.8	2
7.	3
0.85	4

In this county there are several specialists and a number of cases are naturally referred to them by other physicians. When looking at the above from the standpoint of the clients going from one physician to another without just cause, it does not present an accurate picture. It is difficult at this time to determine accurately how much unnecessary changing is being done.

There is a little difficulty in getting the persons who have had money included in their grant to pay the physicians. About six per cent of the categorical cases will not make payment and payments are made for them through a general assistance supplement. Of this group there are a few who are not willing to make the payment because they prefer a doctor that is not included in the plan. There are some who live in remote places making it difficult to get to centers where the money can be paid to the physicians, and there are a few that do not spend their money as it is budgeted. In addition to the above group, there is about three per cent who do not pay occasionally. They do pay the majority of the time and the amount is continued in their grant. There may be a relative come to visit that requires extra money, there may be a pair of shoes, or many other reasons of a like nature given as the reason for not making the payment. Sometimes they will miss one or two payments and then pay for the months in which they did not pay.

The following is the classification of the diagnosis as given to the welfare department by the physicians. A physician assisted in this in order that we might better be able to get this accurately.

CLASSIFICATION OF DIAGNOSIS

Diagnosis	Per Cent
1. Hypertension and Heart Disease	18.95
2. Stomach and Intestinal Diseases	11.45
3. Burns, Lacerations, Fractures, Sprains and Infections	7.5
4. Bronchitis and Pneumonia	6.66
5. Urological Diseases	6.57
6. Nervous Diseases	5.16
7. Arthritis	4.69
8. Genital and Pelvic Inflammation	3.94
9. No diagnosis and merely Examinations	3.47
10. Mouth and Throat	3.47
11. Ear	3.19
12. Influenza	2.82
13. Eye	2.72
14. Skin Disease	2.25
15. Nose	1.97
16. Blood Vessel Diseases	1.97

17. Psychoneurosis	1.69
18. Gall Bladder Disease	1.6
19. Diabetes	1.5
20. Tumor and Malignancy	1.41
21. Nutritional Disease	1.4
22. Obstetrics	1.12
23. Anesthesia	.94
24. Glandular Disease	.94
25. Rectal	.75
26. Appendicitis	.66
27. Venereal Disease	.47
28. Anemia	.37
29. Contagious Disease	.28
30. Hernia	.09
	100.00

The majority of our clients have indicated they prefer the present plan to the old. The following reasons have been given: there is less red tape, medical care is more easily provided, and there is a feeling of security in case medical care is needed. Those persons who have needed medical care frequently have been the strongest supporters of the plan. The most frequent criticism is the inconvenience in making the monthly payments. The clients would prefer that the payment be made to the medical society for them. A few persons who are not favorable have indicated there have been questions of personalities involved and the plan is not at fault.

The physicians although not receiving very much in a financial way seem to be satisfied with the plan. They like the fact it is no longer necessary to contact the welfare office to get authorization for medical care. They now have the responsibility for determining who is in need of medical care and how much to give. The members have indicated at times they would like to have the hospitalization and drugs excluded from the plan, however, they do realize they are in a better position to control expenditures for these items and continue to accept this responsibility. If some method could be worked out so the payment could be made in a lump sum directly to them they would much prefer that over the present plan of collection. All in all the physicians seem agreed that the plan is a step forward and have been willing to cooperate in every way possible to make the plan successful.

The home visitors without exception believe the plan is better than the old system. When the clients have missed making a payment and the visitor has to call in the latter part of the month, they sometimes feel the old plan was better, however, this is not general. They feel the same as the clients and physicians believe the plan of making a lump sum payment direct to the medical society would be better than the present method of payment. The responsibility of determining the need of medical care is removed and this relieves considerable strain to them and the county director. They believe that if possible a plan to include dental care, nursing care, glasses, and ambulance service would also be advisable.

The criticism is undoubtedly true that under the present plan the visitors are not in as close a contact with the physicians as previously. We get reports from the physicians monthly which are brief and cannot give as complete information as when personal contacts were made. This problem should be worked out in the future.

Suggestions for future changes would be making a lump sum payment to the physicians and thereby saving the trouble of paying to the clients, collecting by the physicians, and checking by the visitors. If the plan could include nursing care, dental care, ambulance service, and necessary appliances, it would be a big improvement and no doubt would do a great deal to provide care for our clients that is now being provided in a haphazard manner or not at all.

TUBERCULOSIS CONTROL

PNEUMOTHORAX IN PATIENTS OVER FORTY

Sidney Diamond

Hubert T. Ivey

A survey was made of 431 white World War veterans in whom pneumothorax was instituted or attempted after they had passed their fortieth birthday, during a five-year period beginning January 1, 1935. Every one of the patients had a positive sputum and a roentgenographically demonstrable cavity at the inauguration of his collapse program. Eighty-one per cent had far advanced disease; nineteen per cent had moderately advanced lesions. The disease process was unilateral in 49.3 per cent and bilateral in 50.7 per cent. Fourteen per cent had at least one cavity whose diameter exceeded four cm. The average age was slightly under forty-four years —seven per cent were over fifty. The duration of the patients' tuberculosis prior to the attempted induction of pneumothorax ranged from one month to eighteen years.

Patients with apparently permanent closure of the cavities and conversion of the sputa were classed as "Successful" and these numbered ninety-two, or 20.2 per cent. The "Unsuccessful" numbered 48.7 per cent and the "Impossible" 31.1 per cent. The

various complications of artificial pneumothorax occurred with no greater frequency than among younger patients. Death was due directly to the complications of pneumothorax in five patients. Sixteen of the patients who died had pure tuberculous empyemata, though it is difficult to estimate the degree in which the presence of intrapleural pus contributed to these deaths, for in all cases the pulmonary lesion was actively progressive. Including these sixteen cases, the fatalities consequent to complications would number only twenty-one or 4.9 per cent of the patients treated, about what may be expected in general.

The shorter the time the patient has been ill and the less extensive his lesion, the greater the chances for the success of the therapy and the smaller the probability of occurrence of empyema. Closure of the cavity is effected earlier in patients whose disease history has been brief, though pleural effusions (a complication of little significance in most cases) are more likely to supervene in persons who have had tuberculosis only a short time.

The time interval of cavity closure and sputum conversion varies directly with the patient's age; most of the pneumothoraces became successful in the latter half of their first year. It seems advisable, therefore, to maintain pneumothoraces of doubtful efficacy for a longer time in persons over forty than would be wise in younger patients.

Bilateral pneumothorax, properly administered in carefully selected cases, is well tolerated and ordinarily occasions no marked respiratory embarrassment. The surgical division of pleural adhesions is necessary to the completion of the collapse in a large number of persons in the fifth decade, just as it is in younger patients.

Weighing the results and the complications, the authors conclude that artificial pneumothorax is of distinct value in the treatment of patients over forty. It is not as effective as in younger persons, but neither is any other therapeutic measure. Thus far it appears that artificial pneumothorax is enduring in its effects in persons over forty, but final conclusions cannot be drawn until most or all patients in the successful group have been observed for a sufficient length of time after reexpansion to permit accurate estimation of the lasting effectiveness of their pneumothorax.—From Tuberculosis Abstracts, July, 1941; abstracted from American Revision of Tuberculosis, April, 1941.

In the United States 5,000,000 people are sick every day, and every year over 10,000,000 have accidents.—Bulletin of The National Tuberculosis Association.

THE EFFECT OF ANESTHETICS UPON THE LIVER

(Continued from Page 297)

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NEWS NOTES

COMMITTEES

Dr. Clyde D. Blake of Hays, President, has announced the following new Society committees which will serve for the year 1941-42:

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FORGOTTEN FACTORIES

Of constantly increasing importance to all Kansas industry is the national defense program. A few Kansas communities have had unusual plant expansion, others have completely new plants under construction or planned. The vast majority of Kansas communities, however, will play whatever part they take in the national defense program with their existing industrial facilities.

A number of the larger factories of Kansas are now in defense production, and this utilization of Kansas resources is a source of earnest and patriotic satisfaction to all Kansas. The picture is yet incomplete, however, and a very real problem of defense production confronts the smaller industries of Kansas.

The full industrial might of the nation—and of Kansas—will not be harnessed until the countless small manufacturing and machine shops are enrolled in defense work. The use of these small plant facilities, while much publicised, has not yet become a fact in Kansas—and the prospect of such use is not as bright as we would like to see it.

Throughout the state there are small plants capable of producing moderate-sized orders—craftsmen capable of close tolerance work—management prepared and willing to take its part in national defense. The majority of such plants have had no opportunity to bid on defense contracts, and many are not on the lists in the army, navy and defense offices.

Such plants are now the chief concern of this commission. We fear that, unless these shops are in line for defense work, there will be a wholesale dislocation of craftsmen and machines from Kansas communities throughout the state. Also the shortage of production materials for peacetime uses may soon force many small factories into idleness.

Apparently the best answer to this problem at the present time is to make sure that every Kansas factory and shop is on the lists of the Defense Contract Service so that they may be invited to bid or recommended for sub-contracting work. Accordingly we are urging every plant in Kansas not so listed, to send a complete description of machines, production capacity and experience to the Defense Contract Service, Federal Reserve Building, Kansas City, Missouri, or to this Commission.

In addition, most of this Commission's staff is now devoting its entire time to defense matters, and will be glad to render any possible assistance to Kansas firms at any time.

KANSAS INDUSTRIAL DEVELOPMENT COMMISSION

STATE HOUSE **TOPEKA**

CONGRESS

H. R. 4965, which includes among other things an authorization and appropriation for the United States Army to employ interns, and which was amended by the House of Representatives to make possible the employment therein of osteopaths as well as graduates of approved medical schools, was passed by the United States Senate on June 30.

In the hearing upon the bill before the Senate Committee on Appropriations, Brigadier General L. B. McAfee, Assistant to the Surgeon General of the Army, made the following comment:

"The change is objectionable because it defeats the purpose of the intern system in Army hospitals. The intern system in Army hospitals was inaugurated shortly after the first World War, in order to act as a feeder, a means of securing medical men, doctors, of class A standards, for the Regular Medical Corps. Many of them were not acquainted with the life in the Army or the practice in our hospitals; and by taking them as interns and giving them a year's course, and then surveying them with the idea of tendering them commissions in the Regular Service, we were able to stimulate our procurement.

Along in November wer select these interns from four year medical men; and each intern selected makes a statement that if tendered a commission following his internship in any Army hospital he will accept the same and will serve for at least three years.

If the provision were extended to include graduates of a school of osteopathy we could not, under our standards, use such graduates in the Medical Corps; and with such an authorization we would be put in the position of training men who we could not accept in the Regular Medical Corps or in the Reserve Corps."

The Senate Committee on Appropriations deleted the osteopathic portion of the amendment inserted by the House of Representatives and included the following statement in its report of the bill to the Senate:

"(1). The War Department maintains a high standard for its medical officers. They must be graduates of schools which have the sanction of the committee on medical education and licensure (Council on Medical Education and Hospitals) of the American Medical Association.

(2). None of the schools of osteopathy have applied to this committee (Council) for inclusion in the list of standard medical schools. Therefore, all of the schools of osteopathy are now substandard as far as medical education is concerned. Until schools of osteopathy are recognized by the American Medical Association as equal to the standard schools of medicine, their graduates are not accepted for service in the Army." (House Report No. 476.)

In the discussion of the bill on the floor of the Senate, Senator Joseph C. O'Mahoney of Wyoming re-submitted the osteopathic amendment and the amendment was again included in the bill by a vote of the Senate. Hence, H. R. 4965 as finally passed contains the authorization for employment of osteopaths as interns in the Army.

Since H. R. 4965 is an appropration measure, the above amendment will be effective only during the fiscal year of the appropriation covered. Likewise, since the amendment was worded in an optional manner the army has the choice of employing or not employing osteopaths as it wishes. There is however, another bill, H. R. 4476, pending in the House of Representatives in which the osteopaths are attempting to have their participation in the Army made permanent.

OSTEOPATHS

Two cases involving osteopaths who were charged in injunction actions with violating the medical practice act were heard by the Kansas Supreme Court on July 1. The cases were State vs. Meucke and State vs. Moore, which were appealed by the defendant osteopaths from the Pratt County District Court and the Barber County District Court respectively.

The osteopaths advanced the argument to the Supreme Court that although they had engaged in medical and surgical procedures such were a part of the practice of osteopathy. The State, as plantiff, argued that this question has been previously decided and that it is therefore not a valid defense.

The cases were argued on behalf of the State by Mr. Theo F. Varner, attorney for the Board of Medical Registration and Examination. The osteopaths were represented by Mr. Earl Hatcher of Topeka.

1942 STATE MEETING

The Sedgwick County Medical Society was host at a meeting held in Wichita on July 2, at which representatives of that society and of the Butler-Greenwood County Medical Society, the Cowley County Medical Society, the Kingman County Medical Society, the Pratt County Medical Society and the Sumner County Medical Society discussed plans for the next annual meeting of the Society which will be held in Wichita on May 11-15, 1942.

The representatives of the Sedgwick County Medical Society stated that the members of that society are very glad to avail themselves of the offer made by the above county medical societies to assist in handling the arrangements for the Wichita annual session and thus that the July 2 meeting had been called for the purpose of preparing and coordinating plans in that regard.

After discussion of various possibilities, decision was made that the Cowley County Medical Society will have charge of the arrangements for the scientific exhibits; that the Sumner County Medical Society shall assist in preparation of the scientific program; that the Pratt County Medical Society will aid in the plans for entertainment events; that the Butler-Greenwod County Medical Society will assist in the arrangements for the golf and trap tournaments; and that the Kingman County Medical Society will provide help in other arrangements.

The Sedgwick County Medical Society is to be congratulated for its experiment in this direction. If the plan of co-sponsorship of arrangements for Society state meetings can be made to operate satisfactorily, it would seem possible that all of the county medical societies in the state can thereby be extended an opportunity to assist in preparing the program and other events of the annual meetings.

APPOINTMENT

Governor Payne H. Ratner recently announced the appointment of Dr. Paul E. Belknap of Topeka as a physician member of the Kansas Committee on Nurtition.

This committee, which will be composed of representa-

INDIVIDUALIZED FORMULAS FOR THE NEWBORN

NORMAL INFANTS

Whole milk ..... 10 ozs.
Water, boiled ..... 10 ozs.
Karo syrup ..... 2 tbs.

Evaporated milk ..... 6 ozs.
Water, boiled ..... 12 ozs.
Karo syrup ..... 2 tbs.

Powdered milk ..... 5 tbs.
Water, boiled ..... 20 ozs.
Karo syrup ..... 2 tbs.

ALLERGIC INFANTS

Evaporated goat's milk .. 6 ozs.
Water, boiled ..... 12 ozs.
Karo syrup ..... 2 tbs.

Hypoallergic milk ..... 10 ozs.
Water, boiled ..... 10 ozs.
Karo syrup ..... 2 tbs.

Sobee ..... 8 tbs.
Water, boiled ..... 18 ozs.
Karo syrup ..... 2 tbs.

NEUROPATHIC INFANTS

Evaporated milk ..... 7 ozs.
Water, boiled ..... 13 ozs.
Barley flour ..... 3 tbs.
Karo syrup ..... 1 tbs.
(cooked ten minutes until thick)

Whole milk ..... 12 ozs.
Water, boiled ..... 6 ozs.
25% Lactic acid ..... 2 tsp.
Karo syrup ..... 2 tbs.

2% Lactic-acid milk .... 18 ozs.
Karo syrup ..... 2 tbs.

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"Newborns tolerate a simple formula consisting of 10 ounces of boiled fresh cow's milk, 8 ounces of sterile water and 1 ounce of mixed sugar. Added carbohydrate in the form of corn syrup is usually better tolerated than the simple sugars, lactose or sucrose. At first, about one ounce of the formula will be taken at a time although the infant is allowed all he will take of the three ounces and the remainder discarded. The allergic newborn may be given evaporated cow's-milk or goat's-milk formulas; the hypertonic newborn thick feeding; the hypotonic newborn, evaporated or lactic-acid milk formulas."

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Minerals	0.6%	1 tablespoon	60 cals.
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tives of various organizations in the state and which will cooperate with a national committee and similar committees in other states, will prepare studies and recommendations on foods, diets, vitamins and other nutritional subjects.

The Kansas committee will consist of twenty members. Dr. Margaret Justin of the Kansas State College of Manhattan will be the chairman.

NEW LICENSEES

The Kansas State Board of Medical Registration and Examination which held its annual meeting at the Wyandotte High School in Kansas City, Kansas, on June 17-18, 1941, announces that licenses will be issued to the following named doctors of medicine.

NAME	ADDRESS
Henry Aldis	Kansas City
Horace A. Anderson	Independence
Henry D. Barker	Junction City
Willis L. Beller	Russell
Anna R. Benjamin	Topeka
Lewis C. Blackburn	Kansas City, Missouri
Loren O. Bohnen	Leonardville
Ralph W. Bohnsack	Kansas City, Missouri
Earl G. Bramble	Oil City
John J. Clark	Kansas City
John G. Claypool	Kansas City
George W. Davis, Jr.	Kansas City, Missouri
Mark Dodge	Salina
Hayden H. Donahue	Wellington
Robert M. Drisko	Kansas City, Missouri
Robert H. Dunham	Iola
Jack C. Dysart	Sterling
B. Landis Elliott	Kansas City, Missouri
Stephen S. Ellis	Coffeyville
Anna H. Entz	Whitewater
Franklin W. Foncannon	Emporia
Morris L. Friedman	Kansas City, Missouri
William H. Fritzemeier	Stafford
John H. Gaskins	Kansas City,Missouri
G. Leonard Harrington, II	Independence, Mo.
Loren W. Haus	Turner
James E. Hemphill	Clay Center
Elmer E. Hinton	Hamlin
William K. Hokr	Ellsworth
Walton C. Ingham	Lawrence
Samuel E. Kerr	Kansas City, Missouri
Roy C. Knappenberger	Penalosa
Louis Kovitz	Kansas City, Missouri
Richard M. Logue	Tulsa, Oklahoma
Dale U. Loyd	Morland
Earl L. Loyd	Salina
Thomas J. Luellen	Newton
John F. McDonnell	Caldwell
James E. McConchie	Washington
Wayne W. McDougal	Colby
Charles R. Magee	Pretty Prairie
Charles E. Magoun	Topeka
Russell J. Maxfield	Garden City
Theodore R. Maxson	Iola
Tjaart R. Nanninga	Abilene
Heinrich W. Neidhardt	Independence
Gaylord P. Neighbor	Overland Park
Rollin R. Nevitt	Moran
Milton H. Noltensmeyer	Kansas City
Richard H. O'Donnell	Hutchinson
Norman H. Overholser	El Dorado
Graham J. Owens	Kansas City, Missouri
John V. Plett	Buhler
John F. Pohlman	Wichita
Albert E. Pugh	Kansas City
Paul Rapoport	Kansas City
Joe G. Reed	Larned
Jack W. Revere	Kansas City
Frank A. Rieke	Shawnee
Emmett J. Riordan	Pittsburg
Thomas P. Robb	Kansas City
Lewis L. Robbins	Topeka
Bruce E. Roesler	Claflin
Paul H. Royse	Kansas City
Michael J. Ryan	Kansas City
James H. Sawtell	Topeka
Jack E. Schiffmacher	Kansas City
Lloyd E. Schwartz	Topeka
Doyle A. Shrader	Sawyer
Louis N. Speer	Osawatomie
Maurice H. Stauffer	Kansas City
Kathryn L. Stephenson	Kansas City, Missouri
Paul L. Stitt	Kansas City
Francis M. Stone, Jr.	Fort Scott
John V. Sullivan	Bird City
Daniel L. Tappen	Saline
Robert M. Thomas	Green
Hill C. Thurman	Lawrence
Robert C. Turner	Mankato
Charles E. Vilmer	Pittsburg
Bernard C. Wildgen	Hoisington
Vincent T. Williams	Kansas City, Missouri
John L. Whitaker	Paola
Doyle C. Whitman	Salina
Edward V. Williams	Ellsworth
Robert S. Young	Fort Scott

The Board held its post examination meeting at Parsons on June 27, for confirmation of the grades of the applicants who had taken the examinations on June 17-18.

The Board will hold a special examination on September 23-24, 1941, in Kansas City, Kansas, for the September graduates of the School of Medicine, University of Kansas.

The next regular meeting of the Board will be held in Topeka, at the Kansan Hotel, on December 9-10, 1941.

At the annual meeting on June 17, Dr. M. C. Ruble of Parsons was reelected President of the Board for the ensuing year, and Dr. J. F. Hassig of Kansas City was reelected Secretary for a term of four year. Other members of the Board are: Dr. H. E. Haskins of Kingman, Dr. J. E. Henshall of Osborne, Dr. C. E. Joss of Topeka, Dr. O. L. Cox of Iola, and Dr. R. G. Ball of Manhattan.

ROCKY MOUNTAIN MEDICAL CONFERENCE

The members of the Society have been extended an invitation to the Third Biennial Rocky Mountain Medical Conference which will be held at the Canyon Hotel in Yellowstone National Park from September 2-4. The following guest speakers are scheduled to appear on the scientific program: Dr. Frank H. Lahey of Boston, President of the American Medical Association; Dr. James G. Carr of Chicago, Illinois; Dr. Guy A. Caldwell of New Orleans, Louisiana; Dr. Winchell McKendree Craig of Rochester, Minnesota; Dr. Alex F. Hartmann of St. Louis, Missouri; Dr. Clarence M. Hyland of Los Angeles, California; Dr. Arnold S. Jackson of Madison, Wisconsin; Dr. Rosco G.

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FRACTURES & TRAUMATIC SURGERY—Two Weeks Intensive Course starting September 22nd. Informal Course every week.
GYNECOLOGY—Two Weeks Intensive Course starting October 20th. One Month Personal Course starting August 25th. Clinical Course every week.
OBSTETRICS — Three Weeks Personal Course starting August 4th. Two Weeks Intensive Course starting October 6th. Informal Course every week.
OTOLARYNGOLOGY — Two Weeks Intensive Course starting September 8th. Informal Course every week.
OPHTHALMOLOGY — Two Weeks Intensive Course starting September 22nd. Informal Course every week.
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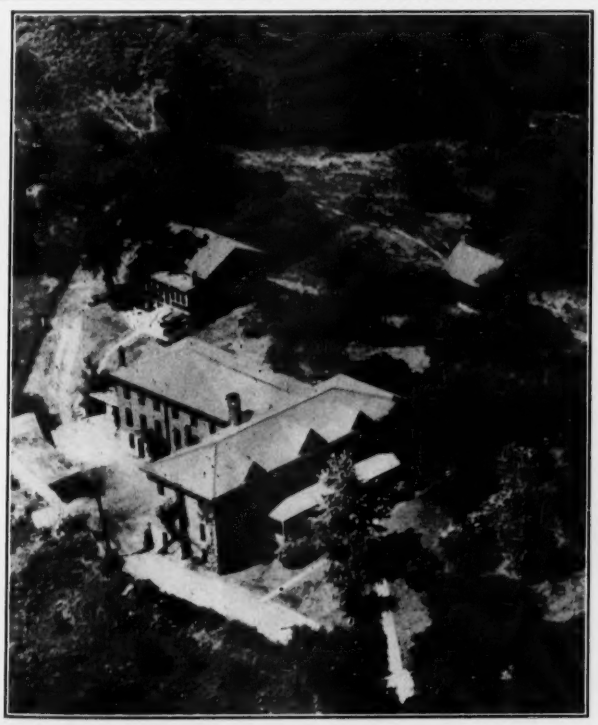

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Leland of Chicago, Illinois; Dr. Norman F. Miller of Ann Arbor, Michigan, and Dr. John R. Nilsson of Omaha, Nebraska. The conference is sponsored by the medical societies of the states of Colorado, Montana, New Mexico, Utah and Wyoming, with Wyoming acting as the host for the 1941 meeting.

ANNUAL RE-REGISTRATION

The annual registration fee for Kansas doctors of medicine is due and payable July 1, 1941. The fee is $1.00 until October 1, after which time there is a penalty of $5.00 required by law for reinstatement of a Kansas license.

Notices were mailed out June 20 to the last known address of each licensee, and if any doctor has not received his notice, he should notify Dr. J. F. Hassig, Secretary, Kansas State Board of Medical Registration and Examination, 905 North Seventh Street, Kansas City, Kansas.

TECHNICIANS COURSE

Washburn Municipal University of Topeka has announced that it will institute a medical technicians course effective with the beginning of school this year. The course will be four years in length and a Bachelor of Science Degree will be conferred upon graduation. Graduates will also be qualified to take the registry examination given by the American Society of Clinical Pathology. The fourth year of the course will include practical experience in approved hospitals, in order that students may obtain actual practice as well as theoretical instruction.

Dr. W. M. Mills and Dr. J. L. Lattimore of Topeka are members of the Board of Regents of the University.

QUESTIONNAIRE

To date sixty-seven county medical societies in this State have returned the medical preparedness questionnaire pertaining to physicians who are available and non-available for military service. The presidents of the county medical societies in each county were asked to make arrangements for the assembly of this information. The completed copies of the questionnaire will be forwarded to the Committee on Medical Preparedness of the American Medical Association.

COUNTY SOCIETIES

The Central Kansas Medical Society held a meeting on June 19 in Ellsworth. Speakers were Dr. Clyde D. Blake of Hays who spoke on "Appendicitis"; Dr. L. E. Eckles of Topeka who spoke on "Measles," and Dr. Alfred O'Donnell of Ellsworth who spoke on "History of the Central Kansas Medical Socity." A dinner, at which the wives of members attended, was held following the scientific program. The next meeting of the society will be held in Russell on September 18.

The Cowley County Medical Society met in Arkansas City on June 19. Dr. V. L. Pauley of Wichita spoke on "Treatment of the Prostate Gland." Dr. C. T. Moran of Arkansas City spoke on "Masking of Symptoms of Sulfanilamide in Mastoid."

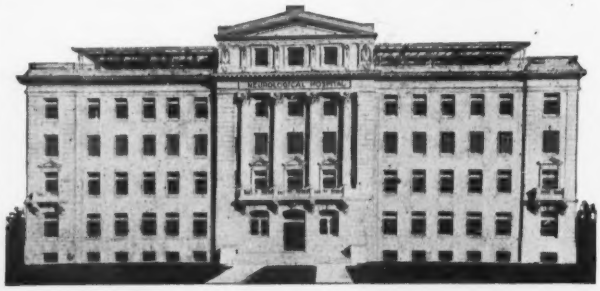
The Golden-Belt Medical Society held a dinner meeting in Manhattan on July 10, with the Riley County Medical Society as host. Speakers were: Dr. Charles Shofstall of Kansas City, Missouri, who discussed "Routine Office Procedure or Treatment of the More Common Pharyngeal and Nasal Conditions" and Dr. C. C. Dennie of Kansas City, Missouri, who spoke on "Dermatoses in Infants and Children." Drs. C. D. Armstrong of Salina and E. H. Decker of Topeka discussed the papers. Following the dinner, Mr. Howard Hill, of the Kansas State College of Manhattan was a speaker and Dr. E. Raymond Gelvin of Concordia showed movies of a recent trip.

The Barber County Medical Society met on July 9 at Fort Scott. The speaker for the meeting was Mr. R. E. Graham of Oklahoma City, Exceutive Secretary of the Oklahoma State Medical Association.

A meeting of the Lyon County Medical Society was held on July 1 in Emporia. Speakers were Dr. A. W. Corbett of Emporia who discussed "Appendicitis in Adults" and Dr. D. R. Davis of Emporia who discussed "Appendicitis in Children."

The Pratt County Medical Society held a dinner meeting on June 27 in Pratt. Guest speakers were: Dr. A. E. Hiebert of Wichita who spoke on "Burns" and Dr. J. V. VanCleve of Wichita who discussed "The Diagnosis and Treatment of the Commoner Skin Ailments."

The quarterly meeting of the Southeast Kansas Medical Society was held in Altamont on June 18. Dr. Henry N. Tihen of Wichita reviewed "Therapy in Gastro-intestinal



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******Facts from:* Proc. Soc. Exp. Biol. & Med., 1934, 32, 241-245; N. Y. State Jrl. of Med. Vol. 35, No. 11,590; Arch. of Otolaryngology, Mar. 1936, Vol. 23, No. 3,306

Diseases" and Dr. Fred J. McEwen of Wichita spoke on "Cardiac Emergencies and Their Treatment."

The Sumner County Medical Society met in Wellington on June 19. Speakers were Dr. Ray A. West of Wichita who spoke on "Toxemias of Pregnancy" and Dr. J. Allen Howell of Wellington who discussed "The Role of Anesthetics and Analgesias in Obstetrics."

The Wilson County Medical Society met in Neodesha on June 2. A symposium on "The Heart and High Blood Pressure" was conducted with all in attendance participating in the general discussion.

MEMBERS

Dr. Ernest Seydell of Wichita was elected president of the American Otological Society at a meeting of that society held in Atlantic City on May 26-28, 1941.

Dr. A. L. Ashmore of Wichita was selected as Kansas Governor of the American College of Chest Physicians, at the recent meeting of that organization held in Cleveland, Ohio, from May 31 to June 2, 1941.

Dr. Ralph L. Drake of Wichita was made a diplomate of the American Board of Psychiatry and Neurology at a meeting of that Board held at Washington, D. C., on May 2-3, 1941.

Dr. O. W. Miner of Garden City has been appointed city physician of that city for a two-year term.

Dr. C. C. Hawke of Winfield presented a paper on "Castration vs. Vasectomy as a Surgical Procedure for the Feeble Minded" before The American Association on Mental Deficiency which was held at Salt Lake City, Utah, on June 20-25. Dr. Hawke was also elected Regional Director for the North Central States of the organization at the meeting.

Announcement was recently made that the following members serving in the military forces have received promotions in rank: Dr. L. B. Gloyne of Kansas City, Dr. Earl B. Ross of Wichita, and Dr. E. K. Lawrence of Hiawatha have been promoted to the rank of Lieutenant Colonel. Dr. L. E. Knapp of Wichita has been promoted to the rank of Major.

DEATH NOTICES

Dr. William George Bourse, 66 years of age, was killed by a train on June 20 in Goff. Dr. Bourse was graduated in 1906 from the Kansas Medical College of Topeka and had practiced in Goff for twenty years. He was a member of the Nemaha County Medical Society.

Dr. Frederick Emmett Dillenbeck, 74 years of age, died on June 5 after a long illness, at his home in El Dorado. Dr. Dillenbeck was born in St. Lawrence County, New York, in 1867 and was graduated from the University College of Medicine of Kansas City in 1896. He was a member of the Butler-Greenwood County Medical Society.

Dr. Walter H. Graves, 88 years of age, died on June 14 at his home in Wichita. Dr. Graves was born in 1853 at Jacksonville, Illinois and was graduated from the Northwestern University School of Medicine in 1882. He was an honorary member of the Sedgwick County Medical Society. Dr. Graves was the last surviving member of the original board of trustees of Fairmount College of Wichita.

Dr. Robert E. Gray, 79 years of age, died June 17, following an automobile accident near his home, in Garden City. Dr. Gray was graduated from the Rush Medical College of Chicago in 1896. He was an honorary member of the Finney County Medical Society.

ANNOUNCEMENT

Examinations for entrance into the Navy as commissioned officers in the Medical Corps will be held for the commission of Acting Assistant Surgeon (Intern) on October 6, 1941, and January 5, 1942, and for the commission of Assistant Surgeon on August 11, 1941, October 6, 1941, and January 5, 1942. Applications must be sent to the Bureau of Medicine and Surgery of the Navy three weeks prior to the date of the examination. Requests for applications should be forwarded to the Bureau which is located in Washington, D. C. Examinations will be held at all of the larger Naval Hospitals and at the Naval Medical Center, Washington, D. C.

The American Congress of Physical Therapy will conduct a course on instructions each morning throughout the Annual Session which will be held in Washington, D. C., on September 1 to 5 inclusive, 1941, with headquarters at the Mayflower Hotel. For information on the courses offered or the general scientific and clinical sessions address: The American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois. The 25th Annual Meeting of the American Occupational Therapy Association will be held in Washington at the same time. For information on the latter meeting address: Mrs. Meta R. Cobb, 175 Fifth Avenue, New York City.

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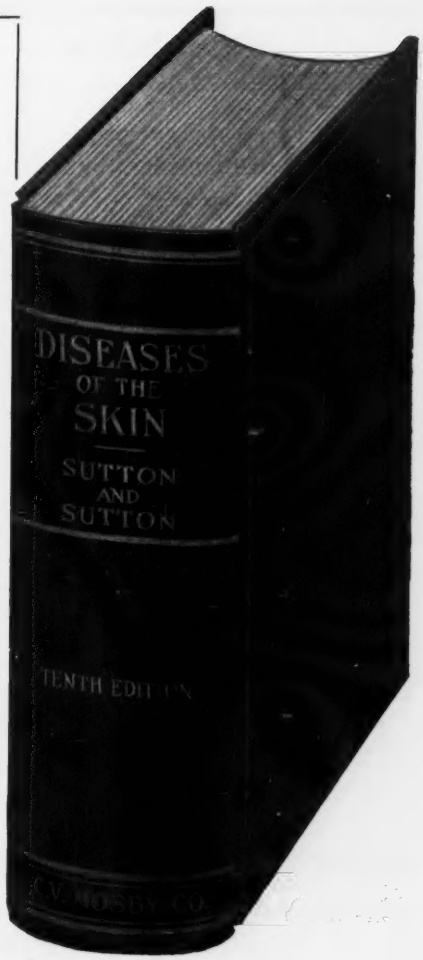

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BOOK NOOK

BOOKS RECEIVED

GETTING READY TO BE A MOTHER — Carolyn Conant Van Blarcom. Published by the Macmillan Company, New York, 1940, Fourth Edition, priced $2.50.

PHYSICAL DIAGNOSIS—Ralph H. Major, M.D., Professor of Medicine, University of Kansas. Published by the W. B. Saunders Company, Philadelphia, Pa., 1940.

MANAGEMENT OF THE CARDIAC PATIENT—William G. Leaman, Jr., M.D. Published by J. B. Lippincott Company, Philadelphia, Pa. 1940. Price $6.50. Containing 255 original illustrations and 705 pages.

GYNECOLOGY, Medical and Surgical — P. Brook Bland, M.D. Third revised Edition, with 445 illustrations and 843 pages. Published by the F. A. Davis Company, Philadelphia, 1939.

PLAGUE ON US—Geddes Smith. Published by the Commonwealth Fund, New York, 1941, Price $3.00. Subtitles are Pestilence; Past Thinking; The Sick Man; The Sick Crowd; Defense; Detective Work; Unfinished Business; Epilogue.

AN INTRODUCTION TO DERMATOLOGY—Richard L. Sutton, M.D., Sc.D., LL.D., F.R.S. (Edin.), Emeritus Professor of Dermatology, University of Kansas School of Medicine, and Richard L. Sutton, Jr., A.M., M.D., L.R.C.P. (Edin.), Assistant Professor of Dermatology, University of Kansas School of Medicine. Fourth Edition Published by the C. V. Mosby Company, St. Louis, Missouri, 1941. With 904 pages and 723 illustrations.

MANUAL OF CLINICAL CHEMISTRY — Miriam Reiner, M.Sc. Assistant Chemist to the Mount Sinai Hospital, New York. Published by the Interscience Publishers, Inc., New York, 1941. Containing 296 pages.

THE 1940 YEAR BOOK OF OBSTETRICS AND GYNECOLOGY—Obstetrics Edited by Joseph B. DeLee, A.M., M.D., and Gynecology Edited by J. P. Greenhill, B.S., M.D., F.A.C.S. Published by the Year Book Publishers, Inc., 304 South Dearborn Street, Chicago, Illinois. Priced at $2.50. Contains 714 pages illustrated.

THE DOCTOR TAKES A HOLIDAY—Mary McKibbin-Harper, M.D., dedicated to the American Medical Women's Association. Published by the Torch Press of Cedar Rapids, Iowa, 1941.

THE MASK OF SANITY, An Attempt to Reinterpret the So-Called Psychopathic Personality—Harvey Cleckley, B.S., B.A., M.D. Published by the C. V. Mosby Company, St. Louis, Missouri, 1941. Priced at $3.00.

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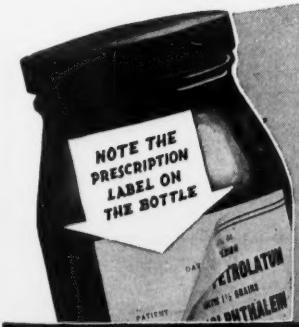

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INTRODUCTION TO PSYCHOBIOLOGY AND PSYCHIATRY, A Text Book for Nurses—Esther Loring Richards, M.D., Sc.D., Associate Professor of Psychiatry, Johns Hopkins University; Physician-in-Charge of the Outpatient Department, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital; Psychiatrist-in-Chief, Baltimore City Hospitals. Published by the C. V. Mosby Company of St. Louis, Missouri, 1941. Priced at $2.50. Contains 357 pages.

EFFECTIVE LIVING—C. E. Turner, A.M., Sc.D., Dr. P.H., Professor of Biology and Public Health, Massachusetts Institute of Technology, formerly Associate Professor of Hygiene, Tufts Medical and Dental Schools, formerly Director of Health Education Studies, Malden, Massachusetts, Chairman, Health Section World Federation of Education Association and Elizabeth McHose, B.S., M.A., Director of Physical Education for girls and Chairman of the Health Council, Senior High School, Reading, Pennsylvania. Published by the C. V. Mosby Company, St. Louis, Missouri, 1941. Containing 432 pages, and 164 illustrations. Priced at $1.90.

A DIABETIC MANUAL—Elliott P. Joslin, M.D., Sc.D., Clinical Professor of Medicine Emeritus, Harvard Medical School, Medical Director George F. Baker Clinic at the New England Deaconess Hospital, Consulting Physician, Boston City Hospital, Boston, Massachusetts. Seventh Edition, Published by the Lea and Febiger Company of Philadelphia, Pa., 1941. Priced at $2.00. Contains 238 pages illustrated.

ESSENTIALS OF DERMATOLOGY—Norman Tobias, M.D., Senior Instructor in Dermatology, St. Louis University, Assistant Dermatologist Firmin Desloge and St. Mary's Hospitals, Visiting Dermatologist, St. Louis City Sanitarium and Isolation Hospital. Published by the J. B. Lippincott Company, Philadelphia, Pa., 1941. Priced at $4.75. Contains 497 pages illustrated.

ELIMINATION DIETS AND THE PATIENT'S ALLERGIES, A Handbook of Allergy—Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, San Francisco, California, and consultant in allergic diseases, Alameda County Hospital, Oakland, California. Published by Lea & Febiger, Philadelphia, Pa., 1941. Containing 264 pages, priced at $3.00.

INFANTILE PARALYSIS, A Symposium Delivered at Vanderbilt University, on April, 1941. Published by the National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York City, 1941. A series of six lectures given under the auspices of the National Foundation for Infantile Paralysis.

PRACTICAL OBSTETRICS—P. Brooke Bland, M.D., and Thaddeus L. Montgomery, M.D. Third revised Edition, illustrated with 502 engravings, and having 877 pages. Published by the F. A. Davis Company, 1939.

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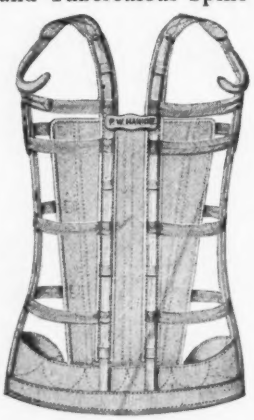

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BOOK REVIEWS

DIRECTORY OF MEDICAL SPECIALISTS, Certified by American Boards, 1939—Paul Titus, M.D., Directing Editor. Published for the Advisory Board for Medical Specialties by the Columbia University Press, New York, 1940. Priced at $5.00. The book is the only official directory of its kind, listing approximately 14,400 diplomates certified by the twelve special American Boards and one of the two affiliate boards. It contains a separate section devoted to each American Board, and a complete alphabetic list of all the diplomates, with addresses and specialty certification. The organization and examination requirements of each Board is explained in full. The following Boards are listed: The American Board of Anesthesiology, Dermatology and Syphilology, Internal Medicine, Obstetrics and Gynecology, Ophthalmology, Orthopaedic Surgery, Otolaryngology, Pathology, Pediatrics, Plastic Surgery, Psychiatry and Neurology, Radiology, Surgery, and Urology. The directory is a valuable source of information for doctors, hospitals, social agencies, organizations and all others affiliated with the medical profession.

A MANUAL OF THE COMMON CONTAGIOUS DISEASES—Philip Moen Stimson, A.B., M.D., Professor of Clinical Pediatrics, Cornell University Medical College. Published by Lea & Febiger, Philadelphia, Pa., 1940. Price, $4.00. The third edition of this manual, much of which has been rewritten, contains sound, concise and helpful material on instruction on the more common contagious diseases, such as diptheria, Vincent's angina, scarlet fever, measles, rubella, whooping cough, mumps, chickenpox, smallpox, meningococcus meningitis and poliomyelitis. The book is a good clinical guide for practitioners, specialists in children's diseases, health officers, school and industrial physicians, internes and nurses. The principles of contagion and serum reactions are discussed with the newest on general management of contagious diseases under varying conditions and treatments for all of the diseases listed.

NEW AND NONOFFICIAL REMEDIES, 1940—Published by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Price, $1.50. The book contains the revised list of articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association, on January 1, 1940. It contains the revised list of articles not accepted; articles off the market; action, use and dosage of articles; composition and standard purity and identity of strength and physical properties on many of the substances. The book is a practical up-to-date text of pharmacology and therapeutics.

PHYSICAL THERAPY FOR NURSES — Richard Kovacs, M.D. Published by Lea & Febiger of Philadelphia. The book is now in its second edition revised, priced at $3.25. The author is an outstanding authority on the subject of physical therapy and has compiled a 335-page manual of instruction for the use in nurses' training to enable the average nurse to assist more intelligently the physician in the application of physical measures. Each of the following physical forces are discussed: physics and physiological effects of heat; radiant heat; artificial fever; ultraviolet rays, physics and effects; heliotherapy; artificial light therapy; electrophysics; general electrotherapy and galvanic current. Dr. Kovacs is clinical professor and director of Physical Therapy of the New York Polyclinic Medical School and Hospital; and Attending Physical Therapist, of Manhattan State, Harlem Valley State and West Side Hospitals of New York.

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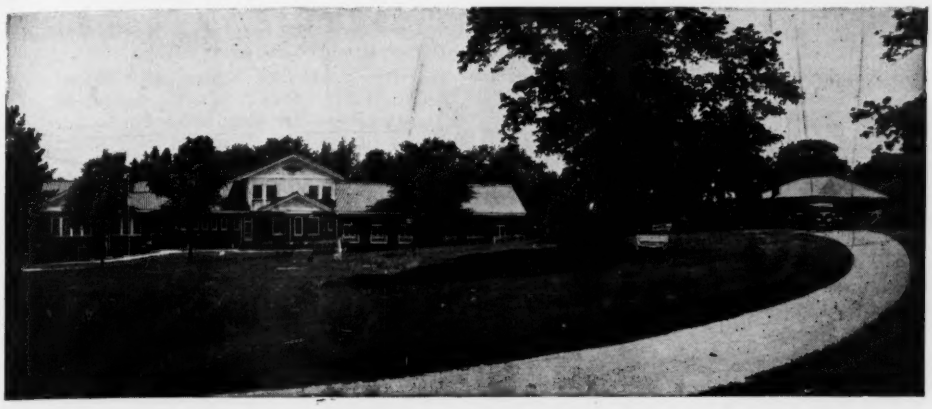

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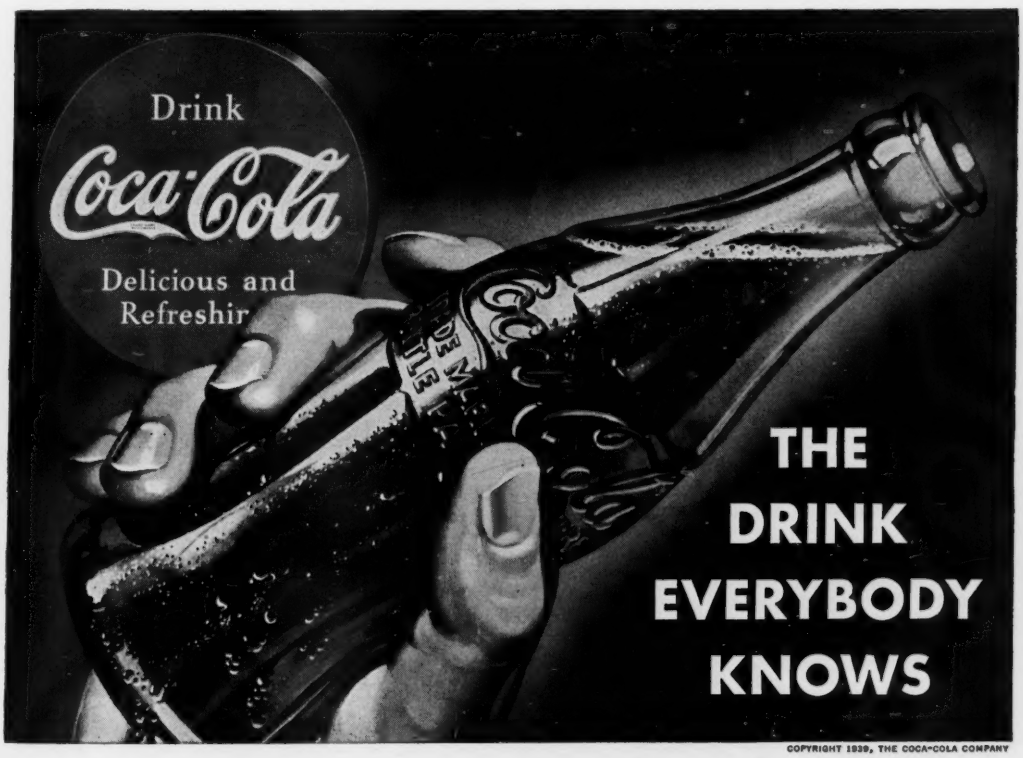

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AUXILIARY

PRESIDENT'S MESSAGE

These are vacation days for many of you but still you can be thinking and doing some constructive planning for the progress of our Auxiliary. We need to encourage and do everything possible to increase our membership. During the past year we gained five new auxiliaries with approximately seventy-six new members. We should make this year an educational year not only in family nutrition, but in legislation and public relations, as they pertain to the medical profession.

A most interesting address was given at Cleveland in which a basic menu was given. We were advised to eat the foods given in this menu first and then to add whatever we like afterwards. We hope that this menu can be printed in this issue of the Journal. A most worth while article on nutrition is on page 2854 of the June 28th issue of the Journal of the American Medical Association.

Let us enter into the new year of work with a determination to study the objectives of the different departments, and the unlimited possibilities of our Auxiliary becoming a valuable asset to The Kansas Medical Society. We must first sell the Auxiliary to ourselves and then—only, can we hope to interest other eligible members.

Mrs. W. Y. Herrick.

COUNCILORS

The councilors of the Auxiliary and the expiration date of their term of office are as follows:

First District—Mrs. M. A. Brawley, Frankfort.....1944
Second District—Mrs. E. R. Millis, Kansas City.....1942
Third District—Mrs. Chas. Miller, Parsons.....1943
Fourth District—Mrs. James Bowen, Topeka.....1943
Fifth District—Mrs. H. W. Jury, Clafflin.....1942
Sixth District—Mrs. Bruce Meeker, Wichita.....1942
Seventh District—Mrs. E. N. Robertson, Concordia....1944
Eighth District—Mrs. Leo Schaeffer, Salina.....1942
Ninth District—Mrs. C. F. Taylor, Norton.....1944
Tenth District—Mrs. Murray Eddy, Hays.....1944
Eleventh District—Mrs. J. R. Campbell, Pratt.....1943
Twelfth District—Mrs. J. B. Ungles, Satanta 1943

BUSINESS ACTION AT CLEVELAND

The National Auxiliary almost unanimously approved the establishment of a permanent central office with a hired secretary. This will facilitate the conduct of business and greatly relieve the president of the Auxiliary of a vast amount of detail and correspondence. The executive committee was empowered to select both the place for the office and also the secretary. The budget presented and accepted for the new year will take care of this expense.

The Advisory Council to the Auxiliary from the American Medical Association sent out questionnaires to all the incoming state presidents asking their opinion on the rais-

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., **23**, 201 (March), 1939.

A complete technique of treatment and literature will be sent upon request

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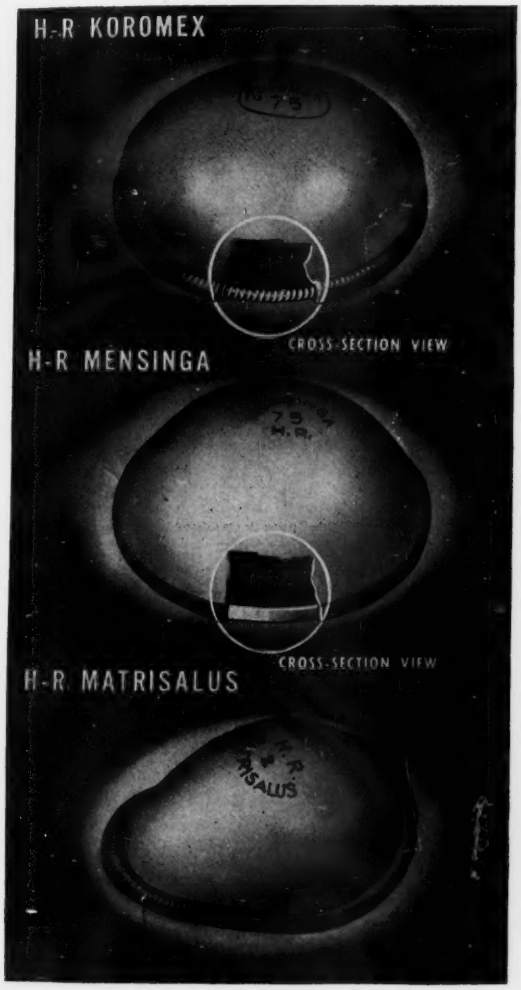

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ing of the National dues from twenty-five cents to $1.00. Six states reported in favor of the raise, two had to wait for annual meeting before giving any answer, twelve were opposed, and several did not make any reply. No action was therefore taken and the dues remain the same. Your president reported that Kansas was not ready for such a big jump in the dues.

NOTICE

Order your Bulletin Now—$1.00 per year.

Address: Mrs. Charles H. Werner, Circulation Manager, 531 North Twenty-fourth Street, St. Joseph, Missouri.

The post-convention issue of the Bulletin of the Women's Auxiliary will soon be ready for publication. Besides interesting convention news it will contain addresses by convention speakers on plans and policies of the Women's Auxiliary for this year with respect to its usual activities and their relation to national defense. Most important of all, it will present the programs of the departments of Hygeia, legislation, program and public relations. These programs will be sent to you in pamphlet form as heretofore, therefore it is necessary for you to send in your subscription to the bulletin at once.

AUXILIARY NOTES

DID YOU KNOW?

Cancer consistently maintains second position as a cause of death in Kansas, preceded only by heart disease?

In 1939—1068 males and 1182 females died of cancer in Kansas?

Cancer authorities state that fifty per cent of all cancer deaths can be prevented, if existing knowledge of how to control the disease is fully utilized? In Kansas this means the possibility of saving more than a thousand lives a year.

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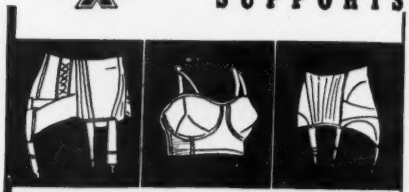

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ADVERTISING NEWS

G. D. Searle and Company, a pharmaceutical manufacturing house, established more than fifty years, is building a new laboratory and plant on the outskirts of Chicago, in the Skokie district. Mr. John G. Searle, president of the company, is also president of the American Drug Manufacturing Association.

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The Library of the Medical Department of the University of Kansas has every desire to be of service to the medical profession in the state. Any physician who wishes to avail himself of the facilities of the Library will be welcome both in the use of its periodicals, bound volumes of periodicals, and monographs and text-books.

Under certain circumstances, provided the volumes are not being actively used by the students, the Library will send such volumes as are needed to physicians in the state, on request, for a period of one week, provided carriage charges are paid both ways.

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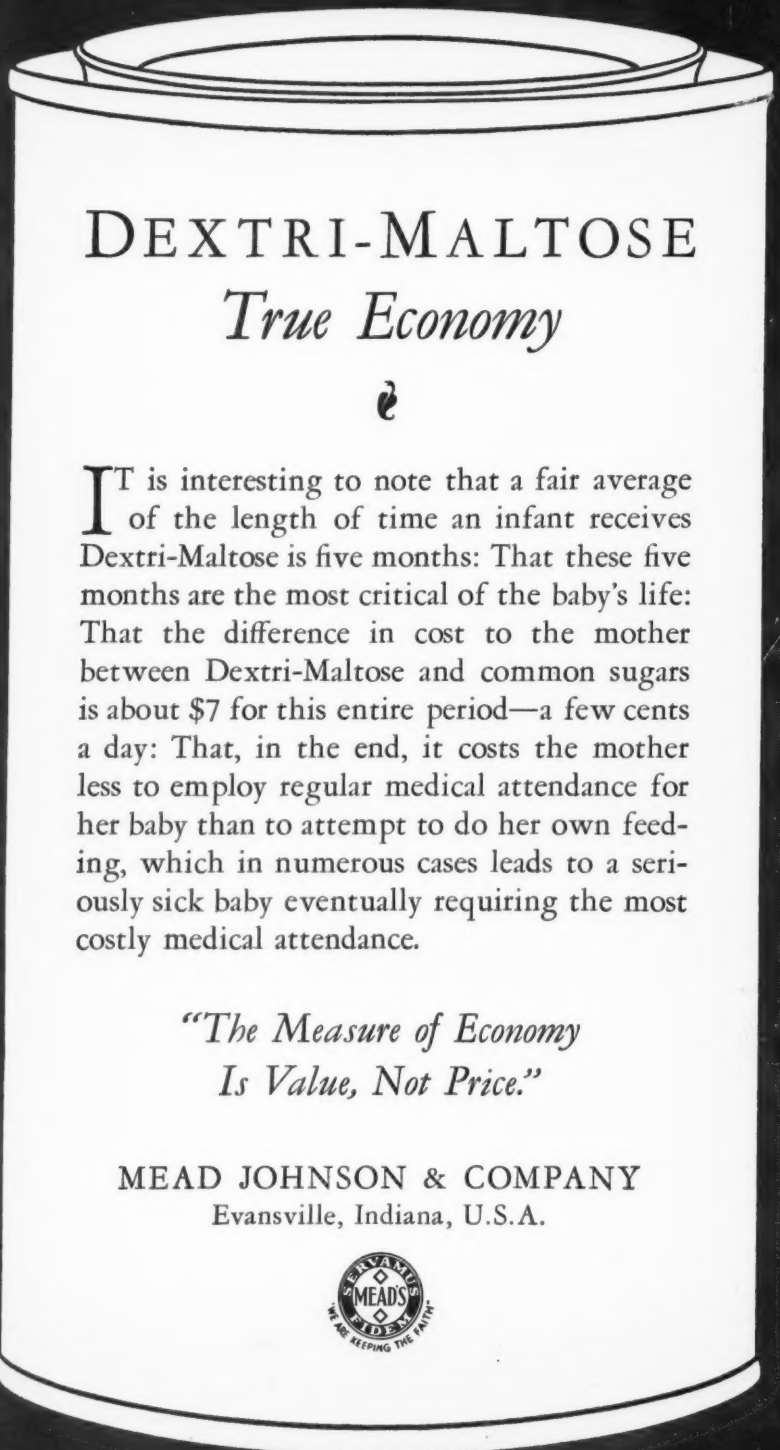

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